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Vol. 1057 Number 2

OFFICIAL GAZETTE

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August 13, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 13, 1985 Volume 1057 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
May 7, 1985. *Acting Commissioner of Patents and Trademarks.*

Patent Cooperation Treaty (PCT) Update

Change in international search fee charged by the European Patent Office, effective Aug. 10, 1985 and guidance regarding requirements submitted under 35 U.S.C. 371.

The International Bureau of the World Intellectual Property Organization has informed the U.S. Patent and Trademark Office that due to a change in the exchange rate between the U.S. Dollar and the German Deutschmark, the dollar amount of the international search fee charged by the European Patent Office for performing a search on PCT applications filed in the United States Receiving Office will increase to $680.00, effective Aug. 10, 1985.

On May 8, 1985, 35 U.S.C. 371 (c) was changed to remove the requirement that a verification statement attesting to the true and accurate nature of the translation be submitted when entering the U.S. Patent and Trademark Office as a Designated Office. Although the verification statement is no longer required at the time of entering the national phase, the translation must still be a true and accurate translation of the international application as filed. Any changes to the claims, for example, deletions of multiple dependencies or cancellations of claims to reduce the national fee, must be submitted in the form of a preliminary amendment separate from the translation of the application as filed.

Translations of amendments to the claims made under PCT Article 19 also must be submitted as a separate paper. Applicants are reminded that both the Article 19 amendments and the translation of those amendments into English must be filed by 20 months from any claimed priority date to avoid cancellation of the amendments to the claims made by the Article 19 amendment. If applicant wishes such cancelled amendments under Article 19 to be considered by the examiner, they may be introduced in the form of an amendment under 37 CFR 1.115.

DONALD J. QUIGG,
July 22, 1985. *Acting Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on August 10, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,343,044 through 4,344,188

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f))	$ 200.00
By other than a small entity	$ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) $ 50.00
By other than a small entity $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,445,290, Re. S.N. 749,638, Filed June 28, 1985, Cl. 037/066, APPLIANCE FOR DREDGING THE BOTTOM OF A BODY OF WATER, Jacques Oules, Owner of Record: *Hydroconsult, S.A., Paris, France,* Attorney or Agent: Samuel Scrivener, Jr., et al., Ex. Gp.: 337

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,456,677, Reexam. No. 90/000,813, Requested: July 3, 1985, Cl. 137/246.11, SELF-LUBRICATING CARTRIDGE FOR USE IN WATER FAUCETS AND THE LIKE, Paul A. Mongerson, Owner of Record: *Stanadyne, Inc., Windsor, Conn.,* Attorney or Agent: Daniel C. McEachran, Ex. Gp.: 340, Requester: Owner

3,962,164, Reexam. No. 90/000,817, Requested: July 8, 1985, Cl. 524/373, SELF-EXTINGUISHING ACRYLONITRILE-BUTADIENE-STYRENE MOULDING COMPOSITION, Hans E. Praetzel, et al., Owner of Record: *Chemische Fabrik Kalk GmbH, Koeln, W. Germany,* Attorney or Agent: None Ex. Gp.: 150, Requester: R. V. Jambor, Chicago, Ill.

4,157,643, Reexam. No. 90/000,819, Requested: July 12, 1985, Cl. 56/341, BALER LOADING APPARATUS, Allan A. White, Owner of Record: *Hesston Corp., Hesston, Kans.,* Attorney or Agent: Schmidt, Johnson, et al., Ex. Gp.: 330, Requester: Sperry New Holland, New Holland, Pa.

4,334,903, Reexam. No. 90/000,811, Requested: July 2, 1985, Cl. 65/3.12, OPTICAL FIBER FABRICATION, John B. MacChesney, et al., Owner of Record: *Inventor,* Attorney or Agent: W. L. Keefauver, Ex. Gp.: 130, Requester: ITT Corp., Secaucus, N.J.

4,356,142, Reexam. No. 90/000,809, Requested: July 2, 1985, Cl. 264/537, INJECTION BLOW MOULDING PET PRODUCTS, Louis Germanio, Owner of Record: *Wheaton, Industries, Millville, N.J.,* Attorney or Agent: Ratner & Prestia, Ex. Gp.: 130, Requester: Owner

COMMISSIONER ORDERED REEXAMINATIONS

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the Orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed. 37 CFR 1.248(a)(5) and 1.525(b).

4,421,119, Reexam. No. 90/000,815, Ordered July 22, 1985, Cl. 128/660, APPARATUS FOR ESTABLISHING IN VIVO BONE STRENGTH, George W. Pratt, Owner of Record: *Massachusetts Institute of Technology, Cambridge, Mass.,* Attorney or Agent: Arthur Smith, Jr., Ex. Gp.: 330, Requester: The Commissioner of Patents, Washington, D.C.

Erratum

"All reference to Patent No. 4,533,014 to Ronnie P. Goff of Va. for 'AUXILIARY FUEL TANK FOR A MOTORCYCLE' appearing in the Official Gazette of Aug. 6, 1985, should be deleted since no patent was granted."

Erratum

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of July 14, 1981, was ordered cancelled and restored to pendency as Trademark Serial Number 73/223,632 as being inadvertently issued by an order dated June 27, 1985, signed by the Assistant Commissioner for Trademarks:

1,161,075	TM 279	July 14, 1981

Consequently, the certificate of registration bearing the above-identified registration number will be cancelled on July 27, 1985 as inadvertently issued. The registration number accordingly has been vacated.

July 10, 1985. PATRICIA M. DAVIS,
Administrator for Trademark Operations.

Patents Available for Licensing or Sale

4,159,103. SLEEVE ACTUATED VALVE. *James A. Oliff, Esq., Parkhurst & Oliff,* 277 S. Washington St., Suite 212, Alexandria, Va. 22314, 703-836-6400.

4,464,141. SHAFT COUPLING. *James A. Oliff, Esq., Parkhurst & Oliff,* 277 S. Washington St., Suite 212, Alexandria, Va. 22314, 703-836-6400.

4,477,912. CORRELATION DATA COMMUNICATIONS SYSTEMS. *James A. Oliff, Esq., Parkhurst & Oliff,* 277 S. Washington St., Suite 212, Alexandria, Va. 22314, 703-836-6400.

3,862, 876. PROTECTIVE EDGE WEIGHTED COVER CLOTH. *L. Graves,* 5927 S. Grant, Littleton, Colo. 80121.

4,323,118. APPARATUS FOR CONTROLLING AND PREVENTING OIL BLOWOUTS. Conrad Bergmann, 1365 Lincoln Ave., San Jose, Calif. 92125.

4,504,702. ADDITIONAL LINE COUPLING CIRCUIT TO AN INTERCOM TELEPHONE SET.

Sherman Levy, Suite 739 Investment Bldg., 1511 K St., N.W., Washington, D.C. 20005.

3,886,809. POSITIVE DRIVE CONTINUOUS GEAR-MESH SHIFT TRANSMISSION SYSTEM WITH PERFECT TIMING. *Laszlo J. Kiss*, 7044 Paige, Warren, Mich. 48091.

3,659,479. POSITIVE DRIVE CONTINUOUS GEAR-MESH SHIFT TRANSMISSION SYSTEM WITH PERFECT TIMING. *Laszlo J. Kiss*, 7044 Paige, Warren, Mich. 48091.

3,468,177. POSITIVE DRIVE CONTINUOUS GEAR-MESH SHIFT TRANSMISSION SYSTEM WITH PERFECT TIMING. *Laszlo J. Kiss*, 7044 Paige, Warren, Mich. 48091.

4,126,214. POSITIVE DRIVE CONTINUOUS GEAR-MESH SHIFT TRANSMISSION SYSTEM WITH PERFECT TIMING. *Laszlo J. Kiss*, 7044 Paige, Warren, Mich. 48091.

4,506,387. PROGRAMMING ON DEMAND CABLE SYSTEM AND METHOD. *Howard F. Walter*, P. O. Box 11617, Fort Wayne, Ind. 46859.

3,680,330. COOLING VESSEL FOR BEVERAGES. *Joseph Francis Canosa*, 5701 Blvd. E., Apt. 3A, West New York, N.J. 07093.

4,477,414. EVAPORATIVE CONTAINER. *Browdy and Neimark*, 419 Seventh St., N.W., Washington, D.C. 20004, 202-628-5197.

4,516,478. CYLINDER DRIVEN RECIPROCATOR. *Dale L. Connelly*, 5439 Thomas Dr., N.E., Albuquerque, N. Mex. 87111.

General Electric Company is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Patent Counsel Gas Turbine Division, General Electric Co., 1 River Rd., Bldg. 500, Room 218, Schenectady, N.Y. 12345.

4,466,253. FLOW CONTROL AT FLASH TANK OF OPEN CYCLE VAPOR COMPRESSION HEAT PUMPS.

Applications for license should be addressed to: Patent Counsel-SSD, General Electric Co., P. O. Box 9555, Philadelphia, Pa. 19101.

4,427,984. PHASE-VARIABLE SPIRAL ANTENNA AND STEERABLE ARRAYS THEREOF.

4,473,737. REVERSE LASER DRILLING.

4,475,111. PORTABLE COLLAPSING ANTENNA.

4,499,655. METHOD FOR MAKING ALIGNMENT-ENHANCING FEED-THROUGH CONDUCTORS FOR STACKABLE SILICON-ON-SAPPHIRE.

Applications for license may be addressed to Patent Counsel, Steam Turbine-Generator Legal Operation, General Electrical Co., 1 River Rd., Schenectady, N.Y. 12345.

4,297,072. MANWAY HANDLING APPARATUS.

4,330,726. AIR-GAP WINDING STATOR CONSTRUCTION FOR DYNAMOELECTRIC MACHINE.

4,465,947. FAN DIFFUSER AND COLLECTOR COMBINATION FOR COOLING SYSTEMS IN DYNAMOELECTRIC MACHINES.

4,476,683. ENERGY EFFICIENT MULTI-STAGE WATER GAS SHIFT REACTION.

4,477,227. KEYING FOR SHRUNK-ON TURBINE WHEELS.

Applications for license may be addressed to: Division Patent Counsel, Mobile Comunications Business Division, General Electric Co., Mountain View Rd., Lynchburg, Va. 24502.

4,506,939. ARRANGEMENT FOR CONNECTING PRINTED CIRCUIT BOARDS.

Applications for license may be addressed to: Patent Counsel, Battery Business Department, General Electric Co., P. O. Box 114, Gainesville, Fla. 32602.

4,131,722. NON-FOULING RESEALABLE VENT.

4,169,918. ARRANGEMENT FOR LIMITING PRESSURE DEVELOPED IN A CLOSED CONTAINER.

4,173,733. BATTERY CHARGER WITH LIQUID CRYSTAL CHARGE CURRENT INDICATOR.

4,186,246. HERMETICALLY SEALED ELECTROCHEMICAL STORAGE CELL.

4,204,161. APPARATUS FOR RAPIDLY TESTING ELECTROCHEMICAL CELLS.

4,207,812. APPARATUS FOR DIE STAMPING CONTAINER CAN ENDS.

4,209,727. APPARATUS FOR CHARGING CAMERA CELLS THROUGH FLASH BULB PACKAGE RECEPTABLE.

4,209,882. LIGHT CELL AUTO SLEEVER.

4,217,400. RECHARGEABLE ELECTROCHEMICAL CELL PACK HAVING OVER-CURRENT PROTECTION.

4,237,409. MULTIPLE-BATTERY CHARGER.

4,245,016. ELECTRODE COATING COMPOSED OF COPOLYMERS DERIVED FROM DIACETONE ACRYLAMIDE.

4,247,603. PLUG-IN RECHARGEABLE BATTERY & SOCKET THERFORE.

4,262,414. HERMETICALLY SEALED ELECTROCHEMICAL STORAGE CELL.

4,271,241. RESEALABLE VENT VALVE FOR CONTAINERS SUCH AS BATTERIES.

4,281,047. ZINC ELECTRODE MADE FROM A MODIFIED ZINC OXIDE FOR USE IN CHARGEABLE ELECTROCHEMICAL CELLS.

4,291,106. BATTERY LINKAGE SYSTEM.

4,292,852. METHOD & APPARATUS FOR PHYSICALLY TESTING THE INTEGRITY OF CONNECTION BETWEEN AN ELECTRODE ASSEMBLY & A TERMINAL CONDUCTOR OF AN ELECTROCHEMICAL CELL.

4,296,546. APPARATUS FOR ASSEMBLING ELECTROCHEMICAL CELL.

4,297,630. TIMED FAST CHARGER.

4,307,158. PRESSURE RELIEF APPARATUS FOR SEALED CONTAINER SUCH AS GALVANIC CELLS.

4,310,421. REUSE OF WASTE WATER IN BATTERY MANUFACTURE.

4,424,476. CONTROLLED FAST CHARGER.

4,434,060. REMOVAL OF HEAVY METALS CONTENT

4,444,954. ELECTROCHEMICAL CELL HAVING INTERNAL SHORT INHIBITOR.

4,451,297. METHOD FOR REMOVING INORGANIC PARTICULATE SOLIDS FROM BATTERY STRIP.

4,452,869. BATTERY WITH IMPROVED TERMINAL STRUCTURE.

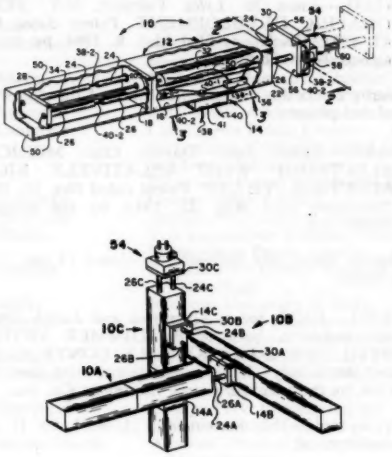
4,468,440. AIR HEATING AND COOLING SYSTEM FOR AIRCRAFT BATTERIES.

4,490,667. SYSTEM AND CIRCUIT FOR CHARGING A RECHARGEABLE BATTERY.

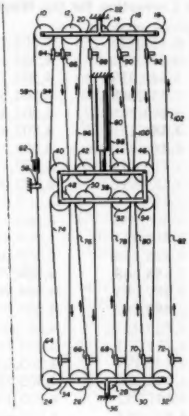
ERRATA

In the Official Gazette, Vol. 1054, No. 2, May 14, 1985, the figures in Pat. Nos. 4,516,476 and 4,516,478 were interchanged. The correct figures are as follows:

4,516,476



4,516,478



PATENT NOTICES

Certificates of Correction for the Week of Aug. 13, 1985

Bl. 4,270,911	4,481,798	4,501,113	4,509,127
PP. 5,399	4,482,231	4,501,165	4,509,619
D. 276,917	4,482,329	4,501,276	4,509,980
D. 278,120	4,482,648	4,501,562	4,510,177
D. 278,342	4,483,246	4,501,825	4,510,322
4,029,821	4,484,221	4,502,676	4,511,009
4,273,333	4,484,430	4,502,738	4,511,010
4,363,091	4,485,478	4,502,873	4,511,193
4,365,197	4,485,652	4,503,007	4,511,526
4,368,400	4,485,721	4,503,360	4,511,985
4,370,866	4,486,095	4,503,735	4,512,211
4,371,348	4,488,223	4,503,914	4,512,563
4,376,193	4,488,436	4,504,042	4,512,904
4,386,201	4,488,668	4,504,775	4,513,058
4,390,499	4,489,065	4,504,966	4,513,107
4,408,994	4,489,382	4,505,016	4,513,165
4,409,200	4,489,487	4,505,054	4,513,245
4,416,637	4,489,735	4,505,167	4,513,254
4,424,446	4,490,199	4,505,220	4,513,449
4,431,376	4,490,809	4,505,282	4,514,195
4,439,564	4,491,752	4,505,334	4,514,367
4,442,191	4,491,894	4,505,449	4,514,386
4,445,033	4,492,046	4,505,664	4,514,392
4,445,215	4,492,236	4,505,690	4,514,486
4,448,957	4,493,083	4,505,725	4,514,545
4,450,803	4,493,090	4,506,166	4,515,017
4,452,447	4,493,412	4,506,266	4,515,112
4,455,495	4,494,161	4,506,827	4,515,299
4,461,945	4,494,822	4,507,106	4,515,581
4,463,371	4,495,309	4,507,141	4,515,918
4,465,119	4,495,376	4,507,231	4,516,537
4,468,464	4,495,591	4,507,382	4,516,779
4,474,586	4,495,766	4,507,779	4,516,974
4,474,933	4,497,112	4,508,185	4,518,556
4,475,976	4,497,816	4,508,205	4,518,557
4,476,081	4,497,925	4,508,229	4,519,584
4,476,486	4,497,953	4,508,278	4,520,033
4,477,343	4,498,146	4,508,604	4,520,847
4,477,413	4,498,514	4,508,660	4,521,216
4,477,629	4,499,901	4,508,850	4,521,293
4,477,684	4,500,500	4,508,968	
4,478,003	4,500,640	4,509,076	
4,480,992	4,500,899	4,509,077	

Disclaimers

D. 275,537.—*Merlin A. Brunner,* New London; *Harvey J. Draheim,* Weyauwega; and *Michael J. Schaffer,* New London, all of Wis. CRIB FOOTBOARD. Patent dated Sept. 18, 1984. Disclaimer filed June 19, 1985, by the assignee, *Simmons Universal Corp.*

The term of this patent subsequent to May 15, 1998 has been disclaimed.

3,347,691.—*James M. Lyles,* Fairport, N.Y. XEROGRAPHIC DEVELOPMENT. Patent dated Oct. 17, 1967. Disclaimer filed Mar. 8, 1984, by the assignee, *Xerox Corp.*

Herby enters this disclaimer to claims 1 through 8 and 13 of said patent.

3,696,807.—*Roman Szpur,* Dayton, Ohio. MEDICAL ELECTRODE WITH RELATIVELY RIGID ELECTROLYTE CUP. Patent dated Oct. 10, 1972. Disclaimer filed Aug. 25, 1983, by the assignee, *NDM Corp.*

Hereby enters this disclaimer to claims 15 and 17 of said patent.

3,746,923.—*Joel S. Spira,* Allentown and *Joseph Licata,* Schenecksville, both of Pa. DIMMER SWITCH WITH LINEARLY MOVABLE CONTROL. Patent dated July 17, 1973. Disclaimer filed Dec. 31, 1984, by the assignee, *Lutron Electronics Co., Inc.*

Hereby enters this disclaimer to claims 1, 10, 11 and 12 of said patent.

4,041,234.—*Fred J. Maske,* St. Paul Minn. DISPERSIBLE GLYOXAL-XANTHAN GUM COMPLEXES. Patent dated Aug. 9, 1977. Disclaimer filed Feb. 25, 1985, by the assignee, *Henkel Corp.*

The term of this patent subsequent to Dec. 14, 1993 has been disclaimed.

4,380,394.—*David W. Stowe,* Buffalo Grove, Ill. FIBER OPTIC INTERFEROMETER. Patent dated Apr. 19, 1983. Disclaimer filed May 17, 1985, by the assignee, *Gould, Inc.*

Hereby enters this disclaimer to claim 2 of said patent.

4,392,882.—*Hans-Jochem Riebel,* Wuppertal; *Ludwig Eue,* Leverkusen; *Wilfried Faust,* Odenthal, all of Fed. Rep. of Germany. Patent dated July 12, 1983. Disclaimer filed Aug. 22, 1984, by the assignee, *Bayer Aktiengesellschaft.*

Hereby enter this disclaimer to all claims of said patent.

4,474,317.—*Roy W. Lessard,* Apple Valley, Calif. PANTS RACK. Patent dated Oct. 2, 1984. Disclaimer filed May 10, 1985, by the inventor.

The term of this patent subsequent to July 2, 2000 has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
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	Boston Public Library	(617) 536-5400 Ext. 265
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	Cleveland Public Library	(216) 623-2870
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 6, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-20-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-11-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	7-16-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-11-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-14-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-07-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-14-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-27-83

Expiration of patents: The patents within the range of numbers indicated below expire during July 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,390,405 to 3,395,405, inclusive

Plant Patents ..... Numbers 2,817, to 2,824 inclusive

REISSUES

AUGUST 13, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

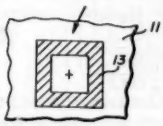
Re. 31,967
GANG BONDING INTERCONNECT TAPE FOR SEMICONDUCTIVE DEVICES AND METHOD OF MAKING SAME

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Original No. 4,063,993, dated Dec. 20, 1977, Ser. No. 593,474, Jul. 7, 1975. Application for reissue May 7, 1979, Ser. No. 37,181

Int. Cl.³ H05K *1/00, 3/06*

U.S. Cl. 430—314 **16 Claims**



1. In a method for fabrication of a gang bonding interconnect tape for interconnecting a first pattern of leads and a second pattern of leads, such interconnect tape having a series of metallic interconnectlead patterns thereon, individual ones of said lead patterns including a plurality of ribbon-shaped metallic leads extending outwardly from an inner central portion of said pattern to an outer region of said pattern and including an individual electrically insulative support structure interconnecting a plurality of said ribbon-shaped metallic leads in a region of said pattern intermediate said outer region thereof and said inner central region thereof, the steps of:

depositing a series of said individual electrically insulative support structures onto said metallic tape, there being at least one of said individual electrically insulative support structures for individual ones of said interconnect lead patterns to be formed in said metallic tape.

12. A method of producing a metal-plastic composite lead frame device for integrated circuit packaging, said lead frame device having a plurality of cantilever metal leads held in fixed alignment near their free ends by a member of plastics material, comprising the steps of:

perforating a continuous web of metallic foil with a plurality of accurately spaced registration apertures along at least one marginal edge thereof;

depositing on a first side of said foil a pattern of thin, electrically insulating plastic meterial accurately aligned with respect to said apertures, said pattern having lesser overall dimensions than said web;

coating the opposite side of said foil with a photoresist material;

imaging a lead frame pattern on said photoresist at accurately aligned positions with respect to said apertures;

developing said imaged lead frame pattern; and

passing said strip through an etching bath whereby said strip will be etched away leaving only a lead frame with the leads supported by said plastics material.

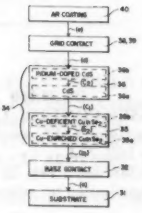
Re. 31,968
METHODS FOR FORMING THIN-FILM HETEROJUNCTION SOLAR CELLS FROM I-III-VI_2 CHALCOPYRITE COMPOUNDS, AND SOLAR CELLS PRODUCED THEREBY

Reid A. Mickelsen, Bellevue, and Wen S. Chen, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Original No. 4,335,266, dated Jun. 15, 1982, Ser. No. 221,761, Dec. 31, 1980. Application for reissue Jun. 14, 1984, Ser. No. 620,637

Int. Cl.³ H01L *31/06, 31/18*

U.S. Cl. 136—260 **147 Claims**



136. A thin-film A-B type heterojunction photovoltaic device wherein "A" and "B" are selected from the group of semiconductor materials consisting of:

A	AND	B
(1) a p-type ternary material	and	an n-type material; or,
(2) an n-type ternary material	and	a p-type material; or,
(3) an n-type material	and	a p-type ternary material; or,
(4) a p-type material	and	an n-type ternary material;

comprising a first semiconductor layer [having been formed with a first region of A-type material and a second superimposed region of transient B-type material with said first and second regions initially defining a transient A-B-type homojunction, and a second semiconductor layer deposited on said first layer and formed of a second B-type material whereupon interdiffusion of the constituent elements defining: (i) said A-type material; (ii) said transient B-type material; and (iii), said second B-type material; causes the transient B-type material to evolve into A-type material so as to form a thin-film] *formed of A-type material and a second superimposed semiconductor layer formed of B-type material deposited on said first layer; one of said first and second semiconductor layers having been formed with a first region of ternary material comprising a selected one of a p-type ternary material or an n-type ternary material, and a second transient region of ternary material of the opposite conductivity type as that selected in said first region, said second transient region of ternary material being adjacent the other of said first and second semiconductor layers, with said first and second regions of said one of said first and second semiconductor layers initially defining a transient homojunction comprising one of a p-n-type or an n-p-type homojunction; whereupon interdiffusion of the constituent elements defining: (i) said first region of ternary material in said one of said first and second semiconductor layers respectively formed of A-type and B-type materials; (ii) said second transient region of ternary material in said one of said first and second semiconductor layers; and (iii), the other of said first and second semiconductor layers; causes the*

second transient region of ternary material to evolve into a ternary material having the same p-type of n-type characteristic as said first region of ternary material so as to form a thin-film A-B-type heterojunction permitting a photovoltaic response characteristic of an energy transducer capable of exhibiting a conversion efficiency approximating on the order of 10%.

Re. 31,969

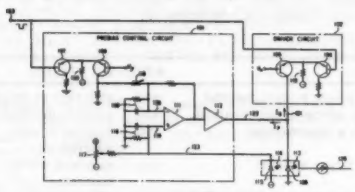
LASER CONTROL CIRCUIT

Darrell D. Sell, Los Gatos, Calif., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Original No. 4,009,385, dated Feb. 22, 1977, Ser. No. 668,824, Mar. 22, 1976. Application for reissue Jun. 4, 1982, Ser. No. 385,024

Int. Cl.[3] **H01S** *3/10;* **H04B** *9/00*

U.S. Cl. 372—38 **12 Claims**



4. A control circuit for an injection laser comprising:

means for conducting a driving current through the laser in response to [the] *an* electrical modulating signal,

amplifier means having input and output terminals,

means for deriving a first voltage input to the amplifier from [an] *the* electrical modulating signal,

means for deriving a second voltage input to the amplifier from the laser optical output, and

means for conducting a current through the laser and the amplifier in response to the difference between the first and second voltage inputs to the amplifier.

Re. 31,970

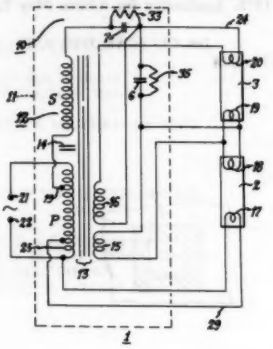
HIGH EFFICIENCY BALLAST SYSTEM FOR GASEOUS DISCHARGE LAMPS

David H. Riesland, Dickson, Tenn.; Edward E. Hammer, Mayfield Village, and Eugene Lemmers, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Original No. 4,185,233, dated Jan. 22, 1980, Ser. No. 891,889, Mar. 30, 1978. Application for reissue Nov. 8, 1982, Ser. No. 440,107

Int. Cl.[3] **H05B** *41/16, 41/232*

U.S. Cl. 315—276 **12 Claims**



13. Ballast apparatus for starting and operating low pressure gaseous discharge lamps comprising, in combination, input terminal means for connection to an alternating current supply to provide input power to the ballast apparatus, high leakage reactance autotransformer means having primary winding means and secondary winding means, said primary winding means being connected at opposite ends to said input terminal means, operating secondary circuit means including at least a portion of said secondary winding means and means for serially connecting low pressure gaseous discharge lamp means to at least said portion of said secondary winding means and at least a portion of said primary winding means, capacitor means serially connected in said operating secondary circuit means for providing a leading current therein, said operating secondary circuit means connected to a tap on said primary winding means for supplying from said primary winding means a predetermined voltage to said secondary circuit means; said tap being so located on said primary winding means to reduce the voltage of said secondary circuit means by an amount in the range of 10–15% of the sum of the primary and the secondary winding means voltages for reducing the ratio of said power input to the lamp light output, the portions of said primary winding means on opposite sides of said tap having the same polarity, said secondary winding means having a single polarity at any point in time.

PLANT PATENTS

GRANTED AUGUST 13, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,532
BEGONIA PLANT NAMED HILDA

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Nov. 1, 1983, Ser. No. 547,671
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant named Hilda, as described and illustrated, and particularly characterized by its deep red flower color; occasional pistillated flowers: ease of propagation; compact, upright growth habit, and by its florif-erousness.

5,533
KLANCHOE PLANT NAMED CITATION

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Nov. 23, 1983, Ser. No. 554,708
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of kalanchoe plant named Citation, as illustrated and described, and characterized by its pink flower color with salmon overtones and white throat, uniform flowering, excellent self-branching, excellent keeping qualities, adaptability to various pot sizes, and by its complimentingthe genetically related cultivars Sensation, Dignity and Royalty.

5,534
AFRICAN VIOLET PLANT NAMED SUGAR PLUM

Arnold Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan American Plant Company, Parrish, Fla.

Filed Oct. 7, 1983, Ser. No. 539,803
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Sugar Plum, as described and illustrated, and particularly characterized by its floriferous, continuous blooming flower habit; two-toned lavender flower color, with the top two petals being darker than the lower three, with each flower being edged in white, and its compact rosette bouquet on erect peduncles above dark green foliage.

5,535
AFRICAN VIOLET PLANT NAMED CINDARELLA

Arnold Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan American Plant Company, Parrish, Fla.

Filed Oct. 7, 1983, Ser. No. 539,804
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Cindarella, as described and illustrated, and particularly characterized by its bright pink flower color; compact rosette habit, with the flowers carried on erect peduncles; floriferous habit, and its medium green and slightly ruffled foliage.

5,536
AFRICAN VIOLET PLANT NAMED KATHRYN

Arnold Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan American Plant Company, Parrish, Fla.

Filed Oct. 7, 1983, Ser. No. 539,805
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant named Kathryn, as described and illustrated, and particularly characterized by its large, dark blue single flowers having slightly ruffled petal margins; compact rosette habit, with the flowers being carried on erect peduncles; floriferous and intermittent year round flower habit, and by its medium green foliage.

PATENTS

GRANTED AUG. 13, 1985

ERRATA

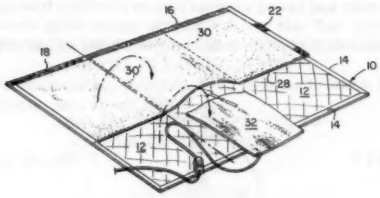
For CLASS	See PATENT NO.
623–006	4,534,069
007–152	4,534,108
403–396	4,534,448
514–575	4,534,911
514–021	4,534,971
514–162	4,534,973
514–161	4,534,974
514–730	4,534,975
514–169	4,534,976
514–196	4,534,977
514–429	4,534,978
514–529	4,534,979
514–570	4,534,980
514–785	4,534,981
426–036	4,534,982
426–293	4,534,983
423–412	4,534,984
546–044	4,535,157
549–455	4,535,175
514–568	4,535,183

PATENTS

GRANTED AUGUST 13, 1985

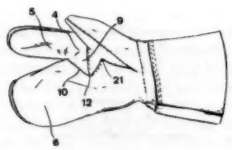
GENERAL AND MECHANICAL

4,534,065
BLANKET GARMENT WRAP
Gloria N. Comfort, 315 Laurel Dr., LaFayette, Ga. 30728
Filed Jan. 30, 1984, Ser. No. 575,272
Int. Cl.[3] A41D *3/00*
U.S. Cl. 2—69.5 **5 Claims**



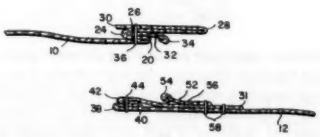
1. A blanket for wrapping into a closed tube about a person's legs or body, said blanket having:
on a first side of the blanket, a single continuous strip of a first type of VELCRO material extending along approximately ⅓ of the length of one edge and a single continuous strip of a second type of VELCRO, for mating with said first type material, extending along the remaining length of said one edge;
on the opposite side of said blanket, a single continuous strip of said second type of VELCRO material extending along said remaining length of said one edge;
first fastening means extending along a second edge on said first side of said blanket, approximately perpendicular to said one edge; and
second fastening means, for mating with said first fastening means, located on said opposite side of said blanket, extending along a line approximately perpendicular to said first edge and located at a sufficient distance from the blanket edges parallel thereto to allow the blanket to be folded into three panels of substantially equal size with mating of said third and fourth fastening means.

4,534,066
GLOVE
Erik Hansson, Box 137, S-811 23 Sandviken, Sweden
Filed Oct. 2, 1984, Ser. No. 657,358
Claims priority, application Sweden, Oct. 7, 1983, 8305526
Int. Cl.[3] A41D *19/00*
U.S. Cl. 2—163 **6 Claims**



1. A glove, the palm portion of which comprises a first finger section intended for the index and a second finger section intended for the middle finger and preferable also for the ring- and little fingers, which index section is formed of a material piece which before the assemblage of the glove was separate from the rest of the palm portion and has portions formed in one piece therewith and projecting upwardly along the sides of the index, the second finger section having portions formed in one piece therewith and projecting upwardly along the side of the middle finger exposed to the index, the material piece forming the index section hanging together in one piece with a material section, which on the palm side projects so as to cover at least that portion, which is closest to the base phalanx of the index, of the region where the thickened bone sections at the joint between the base phalanx bone of the index and the corresponding bone of the metacarpus are intended to be located, the second finger section having portions formed in one piece therewith, which project beyond the place intended for the metacarpus on the palm side of the glove and which at this place are fixed to said material section included in the index section, by a joint extending from a first point at the root of the interspace between the index section and the second finger section to a second point located mainly in the middle region of the metacarpus so that the joint between said first and second points extends, with respect to the longitudinal direction of the hand, obliquely inwards towards the middle region of the metacarpus.

4,534,067
FLY CONSTRUCTION AND METHOD OF FORMING IT
Donald Richardson, Atkinson, N.H., assignor to The Reece Corporation, Waltham, Mass.
Filed May 5, 1983, Ser. No. 491,872
Int. Cl.[3] A41D *1/06*
U.S. Cl. 2—234 **35 Claims**



1. In a fly construction for trousers or the like,
left and right front panels forming the trousers or the like having a fly flap portion integral therewith,
opposite tapes of a slide fastener stringer being secured to the respective fly flap portions,
said left fly flap having a folded edge forming an exposed free edge of the completed fly structure,
said folded edge having integral reinforcing means therein, and
said left and right front panels being joined together at their crotch portions.

12. A method of forming a fly structure for trousers or the like, comprising,
cutting left and right front panels from a supply of material with left and right fly flap forming portions extending from the crotch portion to the waist band edge integral with the front panels,
forming an S-shaped tuck in the material along a predetermined line at the junction of the right fly flap portion and the right front panel to form a slit type pocket with the pocket being open in a direction away from said right front panel,
inserting the tape portion of a slide fastener stringer in said pocket with the slide fastener elements being disposed in the direction away from said right front panel,
folding the right fly flap portion back upon itself along a line spaced from said right front panel and beyond said slide fastener elements,
applying a row of stitches through the S-shaped tuck, the tape portion of the slide fastener stringer and the turned back portion of the right fly flap portion,
doubling back the left fly flap portion on the reverse face of

the left front panel along a predetermined line at the junction of the left front panel and the left fly flap portion,

applying a row of stitches to secure the doubled back fold in place,

placing the tape portion of a slide fastener stringer on said left fly flap portion with the slide fastener elements being disposed in the direction toward the doubled back fold,

applying a row of stitches through the tape portion of the slide fastener stringer and the left fly flap portion, and

joining the left and right fly sections together at the crotch sections by applying stitching thereto.

4,534,068

SHOCK ATTENUATION SYSTEM

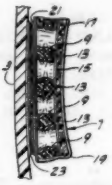
Hal D. Mitchell; Richard W. Glover; Donald R. Walker, all of Rolla, Mo., and Isadore Rosenberg, Downey, Calif., assignors to Figgie International Inc., Willoughby, Ohio

Continuation-in-part of Ser. No. 436,654, Oct. 26, 1982. This application Jan. 9, 1984, Ser. No. 569,246

Claims priority, application United States, Oct. 24, 1983, PCT/US83/01645

Int. Cl.³ A42B 3/02

U.S. Cl. 2—414 **11 Claims**



1. Protective headgear comprising an outer shell of substantially rigid material adapted to be worn on the head, a plurality of shock-attenuating modules on the inside of the shell, and an inner liner of flexible resilient relatively slow-recovery cushioning material, portions of said inner liner being spaced from the shell to form pockets, said modules being disposed in said pockets between the shell and the liner thereby to locate the modules in fixed predetermined positions with respect to the inside of the shell, each module comprising a multiplicity of spaced-apart generally squat tubular columns of resilient synthetic resin material disposed with their axes generally at right angles to the shell, each column being constituted by an integrally formed one-piece tubular member having a slenderness ratio of less than 3.0, said slenderness ratio being the ratio of column length to column diameter, said columns being so dimensioned and configured that, when subjected to an axial impact force of predetermined magnitude, the walls of the columns are adapted resiliently to deform for attenuating the shock resulting from said impact force, said columns then being adapted resiliently to return substantially to their undeformed shape.

4,534,069

INTRAOCULAR LENS AND METHOD OF POSITIONING THE SAME IN AN EYE

Charles D. Kelman, North Shore Towers-269 Grand Central Pkwy. Floral Park, N.Y. 11005

Filed Jan. 27, 1984, Ser. No. 574,676

Int. Cl.³ A61F 1/16, 1/24

U.S. Cl. 623—6 **11 Claims**

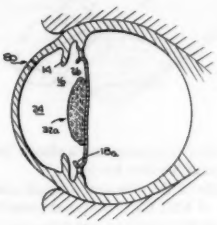
1. An intraocular lens comprising:

a lens body;

resilient position-fixation means for positioning said lens body within an eye, said position-fixation means having a first portion integrally connected with and extending from said lens body and having a second portion extending from said first portion, and said position fixation means being deformable between an expanded condition in which said second portion is remote from said lens body and a contracted condition in which said second portion is adjacent to said lens body; and

a layer of material which is soluble in the eye, connecting said lens body to said second portion of said position-fixation means in said contracted condition thereof, thereby maintaining said position-fixation means in said contracted condition during insertion thereof into the eye.

7. A method of positioning an intraocular lens in an eye, the lens comprising a lens body and resilient position-fixation means for positioning said lens body within an eye, said position-fixation means having a first portion extending from said lens body and having a second portion extending from said first portion, and said position-fixation means being deformable between an expanded condition in which said second portion is



remote from said lens body and a contracted condition in which said second portion is adjacent to said lens body, comprising:

deforming said position-fixation means into said contracted condition thereof;

applying to said lens with deformed position-fixation means a layer of material which is soluble in the eye;

connecting said lens body to said adjacent second portion of said position-fixation means with said material to maintain said position-fixation means in said contracted condition thereof;

inserting said lens into the posterior chamber of the eye; and

allowing said material to dissolve in the eye for seating said lens in the eye.

4,534,070

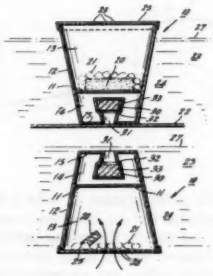
AUTOMATIC TOILET BOWL CLEANER AND DEPLETION SIGNAL

Michael C. Hauptmann, Pearl River, N.Y., and Charles G. Russomanno, Irvington, N.J., assignors to Block Drug Company, Inc., Jersey City, N.J.

Filed Aug. 6, 1984, Ser. No. 637,747

Int. Cl.³ E03D 9/02

U.S. Cl. 4—228 **7 Claims**



1. A toilet bowl water treatment device comprising a container having a bottom wall, a top wall and an intermediate

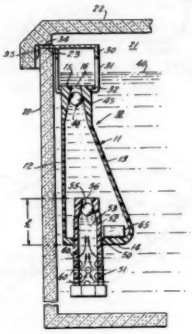
wall defining an upper chamber and a lower chamber; means for supporting material for treatment of the water on the intermediate wall; the lower chamber being closed to provide an inner chamber; the upper chamber in which said treatment material is carried being accessible to external water; an additional chamber at the bottom of the container; said additional chamber being open to the bottom of the container and containing a water coloring material supported therein; the opening from the additional chamber to the bottom wall of the chamber being substantially closed when the container is placed on a flat surface.

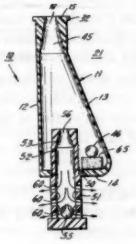
4,534,071

AUTOMATIC DISPENSER FOR DISINFECTANT AND BOWL CLEANING FLUID

Charles Russomanno, Irvington, N.J., assignor to Block Drug Company, Inc., Jersey City, N.J.

Filed Aug. 6, 1984, Ser. No. 637,748
Int. Cl.³ E03D *9/02*
U.S. Cl. 4—228 **5 Claims**





1. A dispensing device for dispensing a liquid containing a cleaning and/or disinfecting material into the tank of a flush toilet wherein the dispensing device may be stationarily hung in the tank and the dispensing device comprises:

a container having a bottom wall and a top opening;

an interior floating ball valve for closing the top opening;

an opening in the bottom wall having a drainpipe inserted therein, the drainpipe having an opening at the top thereof inside the container and at least one opening in said drainpipe below the bottom of the container; and

a floating ball valve responsive to the level of water within the drainpipe to close the opening at the top of the drainpipe;

said dispensing device being adapted to be supported in the container at a level wherein the top opening is below the top level of the water in the tank when the water in the tank is at rest;

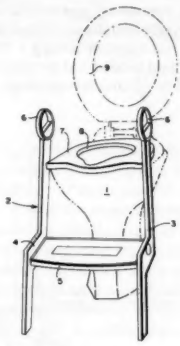
said ball valves being displaced away from said openings and permitting water to flow therethrough when the water level in the tank drops thereby permitting water from the said container to flow out through the lower drainpipe opening into said tank; said ball valves being adapted to close said respective openings when the water level in the tank rises.

4,534,072

W.C. SEAT FOR CHILDREN

Mordechai Lipski, New Industrial Area, Accadia Hwy., Herzliya, Israel

Filed Jun. 4, 1984, Ser. No. 616,688
Claims priority, application Israel, Jul. 8, 1983, 69189
Int. Cl.³ A47K *13/00*
U.S. Cl. 4—237 **4 Claims**



1. A structure for use as a seat on W.C. bowls, comprising:

two legs having an upper portion, a lower portion and a substantially horizontal portion, said substantially horizontal portion located between said upper portion and said lower portion, a seat located between said legs at a height slightly above the height of a standard W.C bowl, said seat having an aperture small enough to prevent an infant from slipping therethrough while permitting body waste of the infant to pass therethrough while the infant is sitting thereon, said seat extending horizontally away from the said legs for positioning over a conventional W.C. bowl, a step extending horizontally in opposite direction to that of the seat at a lower level relative to the seat, said step located between said substantially horizontal portions of said legs and onto which an infant can step and from the upright position on the step can comfortably sit down on the seat.

4,534,073

TOILET SEAT LIFTER

Gene Smith, 411 East 4th St., La Fallotte, Tenn. 37766

Filed Jul. 21, 1983, Ser. No. 516,206
Int. Cl.³ A47K *13/10*
U.S. Cl. 4—251 **6 Claims**

1. A toilet seat lifting apparatus for use on toilets at a preselected height above the floor and secured on the toilet bowl juxtapositioned to the toilet seat forward of the water reservoir and comprising:

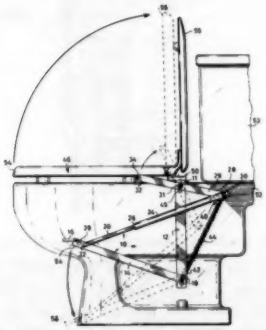
a mounting bracket carried by said toilet bowl whereupon said toilet seat lifting apparatus is attached at some preselected height above the floor, said, mounting bracket further characterized as a single bar bracket, said bar bracket having first and second opposite end portions, said first end portion projecting horizontally and attached firmly to said commode bowl,

said second end portion directed vertically and carrying a

leverage system mounted on said mounting bracket, said leverage system including a foot pedal operable by a user at said preselected height above the floor to perform a lifting and lowering motion on said toilet seat, said leverage system further including a first lever bar carrying said foot pedal and having a first end and a second end, said first end carrying said foot pedal, said second end pivotally connected to said second end portion of said single bar bracket, at least some of said end portions containing preselected circular openings,

an adjustable connecting rod having a first rod member, said first rod member having a first end and a second end, each of said first rod member ends having a preselected plurality of circular openings, said first end of said first rod member joining pivotally with said first end of said bar lever juxtapositioned forward of said foot pedal,

said adjustable connecting rod having a second rod member of greater preselected diameter than said first rod member, said second rod member having a first end and a second end, each of said second rod member ends having a preselected plurality of circular openings,



a second lever bar having a first end portion connected pivotally with said second end of said second rod member of said adjustable connecting rod, said second lever bar having an intermediate pivotal connection to said single bar bracket, said second lever bar having a second end portion carrying a rigidly joined substantially perpendicular lifting rod,

said lifting rod having a first end and a second end, said first end rigidly joined substantially perpendicular to said second end of said second lever bar and contacting the undersurface of said toilet seat along a portion of the length of said lifting rod,

a tension spring having a first end and a second end, said first end attached to the pivotal connection of said second end of said first lever bar with said second end portion of said single bar bracket, said second end of said spring attached to the pivotal connection of said first end of said second lever bar with said second end of said second rod member of said connecting rod.

4,534,074

BATHTUB CUSHION LIFT STABILIZATION

Harry H. Herman, Jr., Bethesda, Md., assignor to International Healthcare Products, Inc., Washington, DC

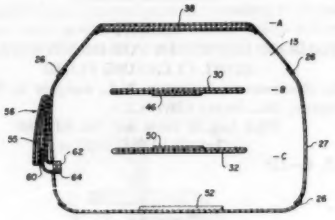
Continuation-in-part of Ser. No. 483,301, Mar. 1, 1983, which is a continuation-in-part of Ser. No. 54,794, Jul. 10, 1979, Pat. No. 4,254,517. This application Feb. 21, 1984, Ser. No. 581,843

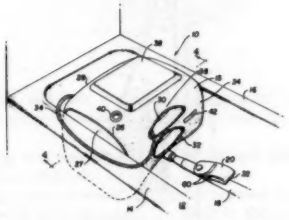
Int. Cl.[3] A47K *3/12*

U.S. Cl. 4—564 **20 Claims**

1. An apparatus for enabling a person with impaired mobility to enter and leave a bathtub comprising:

a water-inflatable cushion lift assembly shell having a shape such that when fully inflated said shell wedges between opposed bathtub sidewalls, said shell, when fully inflated, having a bottom portion engaging the bottom of the bathtub and inwardly tapering upper side portions extending to the top of said shell and defining a platform at about the level of the top of said sidewalls of the bathtub, the volume defined by said tapered portion of said inflated shell being lesser than the volume within the remainder of said shell defined by a height equivalent to the height of said tapered portion, whereby a person with impaired mobility





seated upon said platform may lower and raise himself into and out of the bathtub by releasing and adding water from and to the shell, respectively, and whereby the period of time required to transit a vertical distance between the top of the sidewalls of the bathtub and below the top of said sidewalls, said distance being the height of said tapered portion of the shell, is briefer than the time to transit an additional comparable vertical distance below the top of said sidewalls by virtue of the reduced volume of said tapered top of said shell.

4,534,075

STRETCHER HAVING BACKREST AND SAFETY HARNESS

Alois Schnitzler, Bonn, Fed. Rep. of Germany, assignor to Christian Miesen Fahrzeug-Und Karosseriewerk GmbH, Bonn, Fed. Rep. of Germany

PCT No. PCT/DE81/00103, § 371 Date Mar. 11, 1982, § 102(e) Date Mar. 11, 1982, PCT Pub. No. WO82/00247, PCT Pub. Date Feb. 4, 1982

PCT Filed Jun. 30, 1981, Ser. No. 361,906

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026406; Nov. 6, 1980, 3041932; Jun. 22, 1981, 3124416

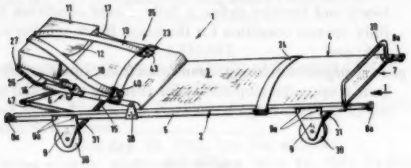
Int. Cl.[3] A61G *1/00*

U.S. Cl. 5—82 R **34 Claims**

1. A stretcher having an adjustable belt for use as a safety belt for keeping a patient in position comprising:

a back cushion, said safety belt attached to said backup cushion for a patient's body and means mounting said backup cushion to said stretcher such that a patient resting against it is kept in a position relative to said stretcher, even when subjected to a sudden motion in the lengthwise direction, toward the head of the patient said backup cushion comprising a backup face means, engageable with

the top portion of the shoulders of a patient, for restraining movement of said shoulders past said cushion, and a



hollow portion to accomodate the head and neck of a patient.

4,534,076

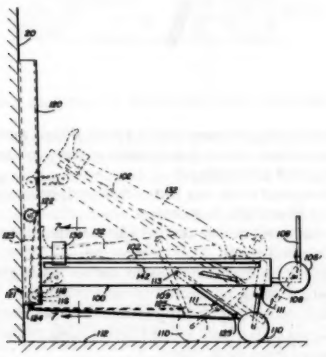
RECLINING RADIOGRAPHIC WALL TABLE

Fred H. Barge, 322 Cameron Ave., LaCrosse, Wis. 54601

Filed May 5, 1982, Ser. No. 375,531

Int. Cl.³ A47C *19/06*

U.S. Cl. 5—147 **5 Claims**



1. A reclining radiographic table including an upright elongated guide structure for support with its lower end adjacent a horizontal support surface, an elongated generally horizontal bed table, support wheel means mounted from one end of said bed table for vertical adjustment relative to said one end between upper and lower positions retracted upwardly toward and projected downwardly from said bed table one end, guide means mounting the other end of said bed table from said guide structure for guided movement therealong, first force means operably connected between said guide structure and said other table end for adjustable positioning of said other table end along said guide structure, said wheel means being provided for rolling support from and movement along said horizontal support surface away from said guide structure upon downward shifting of said other end of said bed table along said guide structure from an upper position with said bed table disposed upright toward a lower position with said bed table generally horizontally disposed, biasing means yieldingly biasing said wheel means toward said upwardly retracted position, and elevation adjustment means operatively connected to said wheel means for adjustably positioning said wheel means, against the biasing action of said biasing means, between said retracted and projected positions, whereby the elevational height of said bed table relative to said support structure, when said bed table is inclined and said bed table is horizontally disposed, may be adjusted.

4,534,077

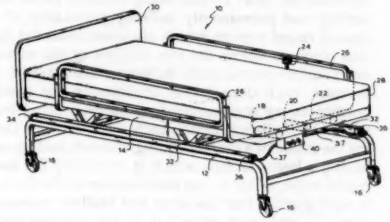
HOSPITAL BED HAVING SAFETY MECHANISM

Kelly D. Martin, Lawndale, N.C., assignor to Simmons Universal Corporation, New York, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,722

Int. Cl.³ A61G *7/06, 7/00*

U.S. Cl. 5—424 **9 Claims**



1. In a hospital bed including a stationary frame, a movable frame for supporting a mattress and patient, and a motor for effecting vertical movement of said movable frame with respect to said stationary frame, the improvement comprising an elongate detection device mounted to one of said frames for detecting the presence of a person or object between said frames, said elongate detection device being an air-tight flexible tube which is compressible against said one of said frames, and means responsive to said detection device for preventing said motor from moving said movable frame closer to said stationary frame.

4,534,078

BODY SUPPORTING MATTRESS

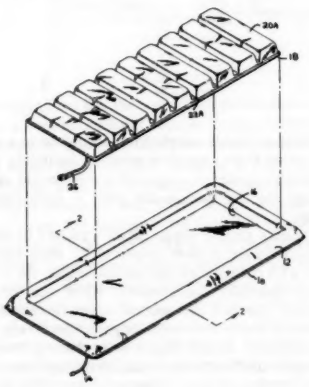
Eric A. Viesturs, and Gundar E. Viesturs, both of Southbury, Conn., assignors to Connecticut Artcraft Corp., Naugatuck, Conn.

Filed Oct. 18, 1983, Ser. No. 543,143

The portion of this patent subsequent to Dec. 27, 2000, has been disclaimed.

Int. Cl.³ A47C *27/08;* A61G *7/04*

U.S. Cl. 5—452 **3 Claims**



1. A body supporting mattress which, when used by bedridden patients, minimizes formation of decubitis ulcers, said mattress comprising:

a first plastic unit which is flat and horizontal and is adapted to be placed upon a bed, said first unit being provided with

a peripherally disposed horizontal endless hollow air filled inflatable tube, said tube defining a raised peripheral border surrounding and enclosing an inner flat horizontal central area of the first unit, said tube being hard when filled with air and having a first vertical height above said central area; and

at least one second plastic unit which is removably disposed on top of said central area, said second unit having an upper section having oppositely disposed inner and outer surfaces, the outer surface being disposed above the inner surface and permanently defining a plurality of closely spaced raised regions which are interconnected by channels disposed below the top surfaces of the regions, the inner surface permanently defining a like plurality of deep recesses, each deep recess constituting the inside of a corresponding region, the deep recesses being interconnected by shallow recesses, each shallow recess constituting the inside of a corresponding channel, said second unit having a lower section which is essentially flat and horizontal and is sealed to the inner surface of the first section in such manner that the deep and shallow recesses communicate with each other but do not communicate with said tube, said deep and shallow recesses being filled with water, said raised regions having a second vertical height above said central area, the second height being lower than said first height, the water filled regions and channels being softer than said air filled tube.

4,534,079

TRANSPORTABLE FOLDING BRIDGE

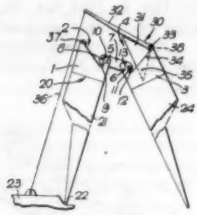
Maurice K. Tucker, Bournemouth, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jun. 10, 1983, Ser. No. 503,254

Claims priority, application United Kingdom, Jun. 17, 1982, 8217584

Int. Cl.³ E05D *7/04*

U.S. Cl. 14—14 **7 Claims**



1. A folding bridge adapted for unfolding in a substantially vertical plane from a support member, including a first and a second bridge girder co-engaged in end-to-end configuration by a hinge and disposed on the prior to unfolding, the hinge including:

a first and a second hinge block attached to said first and second bridge girders respectively, each having an end face with parallel first and second edges, the two end faces being mutually confrontable when the hinge is fully opened, the first and second edges thereupon being disposed as lower and upper edges respectively;

an attachment comprising a lever having two ends, one being pivotally attachable to the second hinge block adjacent the second edge so as to be rotatable about a pivot axis parallel with the second edge, the other being tied to the support member via a linkage, and a fulcrum arm rigidly attachable to the second hinge block having a bearing surface extending radially outwards from the pivot axis so as to be engagable with the lever;

a swinging link having a first and a second end respectively pivotally attached to the first and second hinge blocks so as to be rotatable about an axis adjacent and parallel to the first edge, each end having stop means engagable with the hinge blocks at two angularly displaced locations so as to limit relative rotation between the link and the hinge block and thereby define a fully closed condition and a fully opened condition for the hinge block relative to the link; and

gravity urged restraining means selectively operative during launch upon the stop means for ensuring sequential opening of the two hinge blocks.

4,534,080

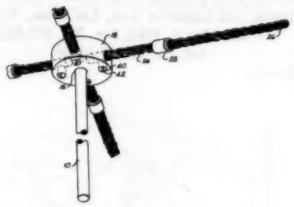
CHIMNEY CLEANING TOOL

Robert S. Young, Rte. 1, Box 827, Pelzer, S.C. 29669, and Wilton Leopard, Rte. 8, Box 196, Piedmont, S.C. 29673

Filed Jan. 30, 1984, Ser. No. 574,848

Int. Cl.³ F23J *3/02;* **A46B** *13/02*

U.S. Cl. 15—23 **4 Claims**



1. A chimney cleaning tool, a power driven motor attached to said chimney cleaning tool rotating said tool, said chimney cleaning tool comprising:

an elongated shaft, one end of said shaft being connected to said power driven motor;

an attachment device carried adjacent the other end of said elongated shaft;

elongated multistrand twisted cables having inner ends thereof being connected to said attachment device and outer ends being radially spaced from said attachment;

said outer ends of said twisted cables being circumferentially spaced from each other;

restricting members carried on said multistrand twisted cable intermediate said outer and inner ends; and

said outer ends of said multistrand twisted cables being free to untwist inwardly to the position of said restricting members to form a plurality of brush-like heads capable of cleaning chimneys and the like.

4,534,081

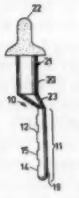
TOOTH CLEANING BRISTLE AND HOLDER

Richard G. Spademan, Box 6410, Incline Village, Nev. 89450

Continuation-in-part of Ser. No. 509,000, Jun. 29, 1983, abandoned. This application Feb. 24, 1984, Ser. No. 583,200

Int. Cl.³ A46B *9/04*

U.S. Cl. 15—167 R **24 Claims**



15. A tooth cleansing bristle comprising a stem rotatably

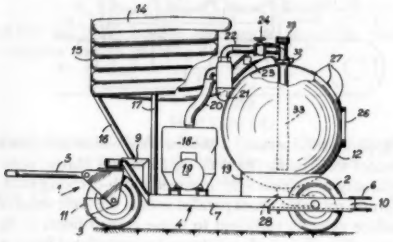
movably engageable with a tooth bristle holder about an axis of rotation and an elongated cleansing head having abrasive cleansing means distributed over at least a part of the length thereof, said cleansing means being offset from and directed toward the axis of rotation of said stem in said holder.

4,534,082

DRAINAGE UNIT FOR AIRCRAFT SANITATION SYSTEMS

Jean-Claude Piquin, St. Herblain, France, assignor to Defontaine S.A., France

Filed Sep. 28, 1982, Ser. No. 425,680
Claims priority, application France, Mar. 16, 1982, 82 04419
Int. Cl.³ A47L *7/00*
U.S. Cl. 15—315 **16 Claims**



1. Draining apparatus for an aircraft sanitation system, comprising:

a mobile wheeled truck having mounted thereon a reservoir for collecting waste material and water, and vacuum-producing means connected to the reservoir for creating a vacuum therein; and

selective take-off means including a siphon, the take-off means being connectable at one end to the reservoir and connectable at the other end to the aircraft sanitation system, so that when connected, the waste material and water are emptied into the reservoir mainly by siphon action, said take-off means having a rigid nozzle attached to the end thereof connectable to the aircraft sanitation system, and further comprising an elastic bellows concentrically mounted on the nozzle, the end of the bellows nearest the free end of the nozzle being slidably mounted on the nozzle and having means for scraping the surface of the nozzle coupled thereto, the end of the bellows farthest from the free end of the nozzle being fixedly attached to said nozzle.

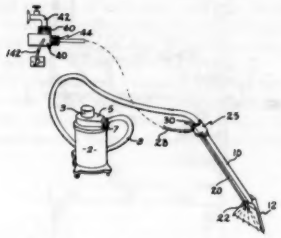
4,534,083

CONTROL VALVE ASSEMBLY

Herbert Hampson, Grafton, Ohio, assignor to Hampson Enterprises, Inc., Elyria, Ohio

Filed Feb. 7, 1983, Ser. No. 464,360
Int. Cl.³ A47L *11/34*
U.S. Cl. 15—321 **2 Claims**

1. For use with a source of water under pressure and a wet-dry vacuum cleaner having a wand for directing a mixture of water and liquid detergent to a fabric to be cleaned and a tank connected to a source of vacuum and said wand for removing said water, liquid detergent and dirt carried therein out of said fabric; and a first conduit means for providing said mixture to said wand, a source of liquid detergent, a control valve connecting to said sources of water and liquid detergent and said first conduit means comprising a valve body having first and second valve chambers formed therein in longitudinal extension with respect to each other, means connecting said first valve chamber to the source of water under pressure, second conduit means connecting said second valve chamber to the source of liquid detergent, first pilot valve means disposed in said first valve chamber, second slave valve means disposed in said second valve chamber and interconnected to said first valve means, said first conduit means being connectable to said second valve chamber and said source of water upon actuation of said second valve means to open position, said first and second valve means being in a normally closed position effective to disconnect the second valve chamber from said first conduit means, normally closed third valve



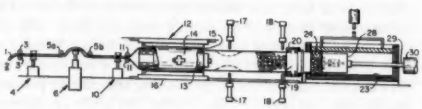
means interconnected between the control valve and said first conduit means being operable to an open position effective to connect said first conduit means to atmosphere, and said first and second valve means being automatically responsive to the actuation of said third valve means to its open position to move said first and second valve means to open valve position effective to cause a mixing of water and detergent in said second chamber and dispensing of said mixture outwardly through said first conduit means to the wand.

4,534,084

MEAT STUFFING APPARATUS

Thomas R. Stanley, Downers Grove, Ill., assignor to Teepak, Inc., Oak Brook, Ill.

Filed Jan. 14, 1983, Ser. No. 458,113
Int. Cl.³ A22C *11/06*
U.S. Cl. 17—39 **22 Claims**



1. An arrangement for the automatic production of stuffed meats from a continuous band tubular casing comprising:

a meat extruder, having a filling nozzle means;

a carrier means for selectively carrying at least a portion of a continuous band tubular casing from a casing uptake and adjustment means to said filling nozzle means and comprising means for engaging the forward open end of said tubular casing with said filling nozzle means; and

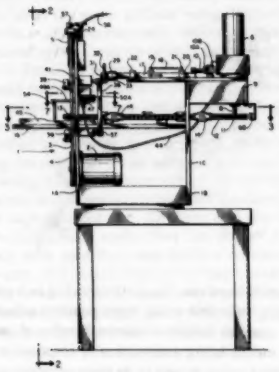
a continuous band tubular casing uptake, lock and adjustment means comprising at least two casing lock means for intermittently engaging and preventing through movement of said casing, a casing uptake and adjustment means for intermittently drawing measured amounts of casing from a casing supply means and intermittently tensioning casing which has been fed to said carrier means, said casing uptake and adjustment means disposed between said lock means comprising an intermittently displaceable casing guide means and, control means for sequentially, intermittently engaging said casing lock means and displaceable casing guide means in casing uptake and tensioning function.

4,534,085

FISH FILLETING SYSTEM

Thomas M. Stewart, Rte. 1, Box 283, Denham Springs, La. 70726

Filed Apr. 21, 1983, Ser. No. 486,998
Int. Cl.³ A22C 25/16
U.S. Cl. 17—46 16 Claims



1. A fish filleting machine, comprising: cutting means for cutting the fish fillets from the central bone section of the fish, said cuttoing means comprising a pair of opposed, moveable band saw blades spaced apart a distance comparable to the thickness of the central bone section of the fish, the cutting edges of said blades being canted toward each other and the incoming fish during the cutting process, the leading cutting edge of said blades being canted inwardly toward the centerline with respect to their own adjacent backside, trailing edges, the amount of cant being of the order of a few degrees;

at least one opposed pair of rotatable guide wheels mounted adjacent to said saw blades but removed from the area where the fish contact said blades during the cutting process, said band saw blades being mounted for travel in contact with said opposed pair of rotatable guide wheels, the axes of rotation of said guide wheels being directed at least generally parallel to the direction of relative travel between the fish and the blades during the cutting process and located out board of said blades, the blade contacting surfaces of said guide wheels being canted forwardly at least during the cutting process an amount of the order of a few degrees causing said blades to be canted inwardly an amount of the order of a few degrees: and

conveyor means associated with said cutting means for positioning and moving the fish and said cutting means relative to one another in cutting engagement during the cutting process.

12. The method of filleting fish on an automated basis with the use of a pair of opposed band saw blades spaced apart a distance comparable to the thickness of the central bone section of the fish, including the following steps:

(a) canting the cutting edges of the blades inwardly toward each other and the incoming, forwardly fed fish during the cutting process so that the leading cutting edges of said blades are canted inwardly toward the operative centerline of the machine with respect to their own adjacent backside, trailing edges in an amount of the order of a few degrees; and

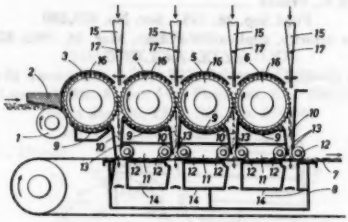
(b) causing the cutting edge to move along the central bone section to closely cut the fillets away from the central bone section of the fish as the fish and the cutting edges of the blades are moved relative to each other in cutting engagement the full length of the fish body.

4,534,086

APPARATUS FOR MAKING FIBROUS WEBS

Ernst Fehrer, Auf der Gugl 28, A-4020 Linz, Austria

Filed Apr. 26, 1984, Ser. No. 604,302
Claims priority, application Austria, May 5, 1983, 1649/83; Nov. 8, 1983, 3919/83; Jan. 16, 1984, 107/84; Jan. 26, 1984, 253/84
Int. Cl.³ D01G 15/26
U.S. Cl. 19—99 12 Claims



1. An apparatus for making a fibrous web, which comprises

(a) a feeder for feeding fibers in the form of a fibrous web,

(b) a plurality of successively arranged tooth-carrying carding drums rotatable about parallel axes in the same sense at a surface velocity sufficient to cause carded fibers to be thrown off each one of said drums by centrifugal force, a first one of said drums being arranged to receive the fibrous web from the feeder,

(c) air-permeable means movable in a direction transverse to the drum axes and having a fiber-collecting surface facing the carding drums,

(1) the carding drums being so closely spaced apart in said direction that each succeeding carding drum cooperates with a preceding one of the drums like a working roller,

(d) discharge ducts in the spaces between the successive carding drums arranged to receive the fibers thrown off respective ones of the drums and to deliver respective streams of said fibers to the fiber-collecting surface at successive locations spaced in said direction whereby the fibers are collected as a fibrous web on the fiber-collecting surface,

(e) means for supplying a stream of air into each one of the discharge ducts to move the streams of fibers to the fiber-collecting surface, and

(f) suction means for sucking the air through the air-permeable means to retain the fibers of the fibrous web on the collecting surface.

4,534,087

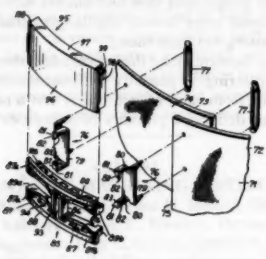
ADJUSTABLE BUCKLE

Wah Lau, 41-31 149th Pl., Flushing, N.Y. 11355

Filed Dec. 1, 1983, Ser. No. 557,059
Int. Cl.³ A44B 11/00
U.S. Cl. 24—163 K 20 Claims

1. An adjustable buckle comprising a first member comprising means to attach said member to the front face of a first material flap, and having engagement means disposed on said front face oppositely disposed from said attachment means, and a second member comprising means to attach said second member to the front face of a second material flap and having engagement means disposed on said second front face and oppositely disposed from said second attachment means, and a cover being formed with tab means to removably engage the

first member engagement means and means to removably engage the second member engagement means in two positions



so that the cover bridges the flaps to secure the flaps in an overlying manner in the two positions.

4,534,088
HOLE PLUG
James Ricke, 38 W. 594 Hilltop Dr., St. Charles, Ill. 60174
Filed Aug. 29, 1983, Ser. No. 526,955
Int. Cl.³ B65D *39/00*
U.S. Cl. 24—295 **8 Claims**

1. A plug for obturating an opening in a panel and the like, said plug comprising a head portion of a diameter sufficient to overlap the opening and a separate shank portion, said head portion having an integral flange portion formed with a bent over edge forming an internal retaining groove, and said shank portion being formed as a flat annular member of an outer diameter substantially equal to the diameter of said groove in said head portion, said annular member having a single transverse slit defining abutting ends and a peripheral edge adapted to be disposed in said groove after assembly by compressibly reducing the outer diameter of said annular member by overlapping said ends and allowing said member to peripherally expand with said edge engaged in said groove and said ends disposed in abutting engagement, wherein said annular member has a plurality of projecting fingers elastically deformable for introduction of said shank portion into the opening, said fingers having a peripheral abutment portion engageable with a surface of said plate at the edge of the opening for preventing removal of said plug from over the opening.

4,534,089
FASTENING DEVICE FOR FLEXIBLE SHEETS
Thomas C. Swan, P.O. Box 389, Dawsonville, Ga. 30534
Filed Apr. 8, 1983, Ser. No. 483,166
Int. Cl.³ B42F *1/00*
U.S. Cl. 24—559 **7 Claims**

1. A fastener for clamping a portion of a flexible sheet, comprising:

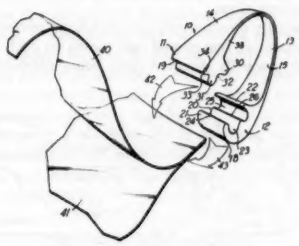
(a) a pair of resilient heads for receiving therebetween said portion of said sheet;

(b) one of said heads having along one side thereof a lug with spaced front and rear locking lobes extending transversely of said one of said heads, said lobes extending toward the other of said heads and diverging from each other in the direction in which they extend, said lobes having convex surfaces;

(c) the other of said heads having front and rear flanges extending transversely of said head, said flanges having spaced opposed concave inner surfaces conforming generally to the outer portions of the convex surfaces of said locking lobes;

(d) said other of said heads defining, between said flanges, an inwardly opening recess for receiving between said flanges said portion of said sheet and said locking lobes, with said front flange extending partially around a portion of said front lobe and said rear flange extending partially around a portion of said rear lobe;

(e) one of said heads having a transverse valley between said front and rear lobes and the other of said heads has a central lobe within said recess, said central lobe being between and spaced from said flanges and protuding to a



lesser extent than the extent of the flanges into said valley of one of said heads, when said lobes are received in said recess;

(f) said front flange extending sufficiently around the front portion of said front lobe, and said front lobe extending into said recess sufficiently that when said portion of said sheet and both of said lobes are fully within said recess, tension applied forwardly on said sheet will not readily force said lug out of said recess; and

(g) said front lobe being confined by said front flange to a greater extent than the rear lobe is confined by said rear flange so that said heads can be urged apart by urging the rear portion of said one of said heads away from the rear portion of the other of said heads as the front portion of one of said heads pivots about the front portion of the other of said heads for releasing said lug from said recess, and said lug cannot be readily removed from the other of said heads by without first removing the said rear lobe from said recess.

4,534,090
RELEASABLE CLASP
Max Skobel, 10 Lynwood Rd., Edison, N.J. 08817
Continuation-in-part of Ser. No. 303,790, Sep. 21, 1981, Pat. No. 4,408,375. This application Jun. 2, 1983, Ser. No. 500,374
The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.
Int. Cl.³ A47G *29/10*
U.S. Cl. 24—625 **14 Claims**

1. A releasable connector comprising:

a female receiving member having opposing longitudinal side walls and opposing longitudinal edges providing an elongated internal passageway extending from one end thereof, and a pair of diametrically opposing retaining slots spacedly positioned along said passageway, said retaining slots being openings extending through said opposing longitudinal edges of said receiving member, said passageway including a mouth at said one end;

a substantially flat elongated male insert member having a

pair of elongated forwardly directed spaced apart, springy arms insertable into said passageway upon compression of said arms together into an abutting position;

each of said arms including an outwardly extending enlarged hand portion at a leading end of each arm for releasably locking into a respective one of said retaining slots when said arms spread apart with each hand portion extending through an associated one of said openings to securely retain said insert member in said receiving member in a locked position;

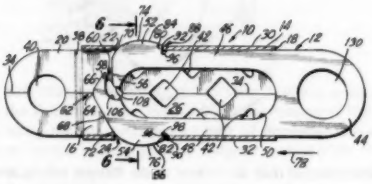
each of said hand portions including cam means for:

(1) engaging said mouth of said passageway to direct said arms together into said abutting position to facilitate entry of said insert member into said passageway,

(2) riding along inner edge walls of said passageway to facilitate passage of said insert member through said passageway, and

(3) engaging an edge of a respective retaining slot to facilitate entry of said hand portions into said retaining slots and to also facilitate exit of said hand portions from said retaining slots;

an inwardly directed edge on each hand portion rearward of a respective one of said cam means on each hand portion, each inwardly directed edge being disposed at an acute



angle rearwardly inclined with respect to longitudinal axis of said insert member to provide a hook-like portion on each hand portion for locking onto said edge of said respective retaining slot;

said hand portions including finger means to prevent walls of said mouth of said passageway from engaging between said hand portions, said finger means including a free end of each hand portion being provided with an inwardly extending finger directed towards the other hand portion, one said finger being spaced forward of and in an overlapping relationship to the other said finger to allow said hand portions to be compressed towards each other and to provide a leading insertion portion for entry into said passageway to thereby facilitate insertion of both arms into said passageway;

abutment means on said hand portions to limit compression of said hand portions together to define said abutting position of said arms, said abutment means including a seat portion provided on a rearward edge of said one finger for abuttingly receiving said other finger thereon; and

said hand portions having a combined transverse width in said abutting position substantially equal to a transverse width of said passageway to provide alignment between said arms and said passageway during insertion of said arms through said passageway.

4,534,091

BATTERY GRID AND METHOD OF MAKING SAME

Richard H. Kline, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 344,130, Jan. 20, 1982, abandoned, which is a continuation of Ser. No. 179,806, Aug. 20, 1980, abandoned. This application Aug. 8, 1983, Ser. No. 521,157

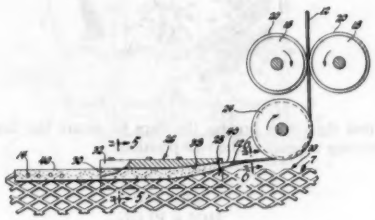
Int. Cl.³ H01M *4/82*

U.S. Cl. 29—2 **3 Claims**

1. A process of making a substantially continuous length of Pb-acid storage battery grid-making stock comprising the steps of:

advancing a narrow lead strip longitudinally between two rows of progressive dies and cutters which converge in incremental steps toward the longitudinal center of the strip passing between them;

expanding the strip along the lateral edges thereof by periodically shearing a plurality of interconnected wire-like segments from each of said edges into a network of said segments defining a plurality of interstices for containing



the battery's active materials said network having a longitudinal distal edge remote from said center;

flattening the thusly expanded strip;

feeding a thin flexible thermoplatic ribbon longitudinally toward said stock so as to converge upon said distal edge;

folding said ribbon lengthwise about said distal edge such as to provide portions of said ribbon on each side of said network at said distal edge; and

spot welding said portions together through said interstices along said distal edge.

4,534,092

APPARATUS FOR JOINING LENGTHS OF METAL STRIP

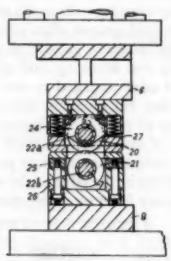
John A. Tracy, Kingston, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Jul. 9, 1981, Ser. No. 281,910

Claims priority, application United Kingdom, Jul. 16, 1980, 8023234

Int. Cl.³ B23P *11/00*; B21D *39/03*

U.S. Cl. 29—21.1 **2 Claims**



1. Apparatus for forming a joint between the ends of successive lengths of metal strip which travels through a processing apparatus comprising a pair of parallel cutter bars arranged on opposite sides of the path of the metal strip and rotatably mounted on supports, provided with means for moving said cutter bars towards and away from each other for application of shearing and forming forces, each cutter bar carrying a plurality of laterally spaced cutter elements non-rotatably mounted thereon, the space between adjacent cutter elements on each cutter bar being substantially equal to the thickness or width of the cutter elements on the other cutter bar, the cutter

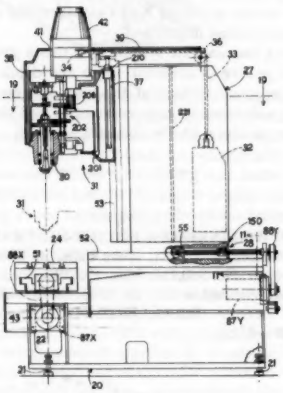
elements on each cutter bar being arranged to mesh with the cutter elements on the other cutter bar, each cutter element having at least a particular periphery, each cutter at selected positions on at least one cutter bar having at least one part-circular cutter section at its periphery and at least one concave peripheral recess of curvature corresponding to the curvature of said cutter section, each cutter bar being provided with means for holding it against rotation in relation to its support in a plurality of operative positions during movement of said cutter bars towards and away from each other.

4,534,093

BEO-TYPE MACHINING SYSTEM

William R. Jahnke, Fairfield; Bruce H. Rockel, Shelton; Barry J. Brown, Stratford; Floyd E. Hawley, Devon; Andrew J. Pennella, Woodmont; John C. Sugrue, Stratford, and William R. Wiggins, Trumbull, all of Conn., assignors to Textron Inc., Bridgeport, Conn.

Filed Sep. 7, 1982, Ser. No. 415,658
Int. Cl.³ B23Q *1/02*
U.S. Cl. 29—26 A **7 Claims**



1. A machine tool for performing a plurality of precisely controlled machining operations on a workpiece, said machine tool comprising:

(A) a support member adapted for securely mounted holding interconnection of three independent way members to three surface areas thereof, the support member being further defined as comprising:

(1) a support base for secure retained holding interconnection of two of the three way members,

(2) a cooperating head support portion adapted for receipt and mounted interconnection with the third way member, and

(3) a way member holding pivot pin secured therein along each of the way member receiving surface portions thereof, with a section of each pin extending above the way member receiving surface portion;

(B) three independent, elongated way members, each defining one of the three cooperating axes employed in precisely controlling each machining operation, each of the way members

(1) comprising a single, unitary structure securable to one of the way member receiving surface portions of the support member,

(2) having a pair of spaced, cooperating flanges, each defined by two parallel guiding surfaces,

(3) said guiding surfaces of each flange being machined flat to define a first pair of parallel planes, each of said first pair of planes being formed by the opposed, spaced, guiding surfaces of opposite flanges,

(4) with means forming a third pair of flat guiding surfaces being positioned in cooperating spaced relationship defining a second pair of planes, and

(5) each elongated way member incorporating preliminary alignment means and final anchoring means cooperatively connecting the way member to the support member in precise alignment, the preliminary alignment means being a pin-receiving hole formed therein along the central axis thereof and having an axis substantially perpendicular to the first pair of parallel planes, with said pin-receiving hole being positioned for telescopic receipt of the pivot pin extending from the support member for engagement therewith, mounting each of the way members for angular pivoting movement through a limited arc about the axis defined by said pivot pin;

(C) a powered machine tool driver mounted for movement along two of said three independent way members; and

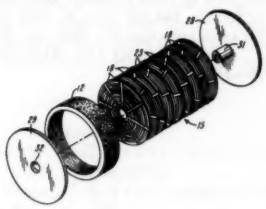
(D) a workpiece supporting table slidably mounted to the third way member for movement therealong; thereby providing an economical system for securely mounting the way members to the support member in precise alignment while also assuring that each way member is angularly adjustable to be preliminarily positioned precisely perpendicular to the other two way members, and may then be anchored in this aligned position, whereby a machine tool is achieved wherein the way members thereof are machinable with precision prior to installation, and machining adjustments thereto during installation are eliminated.

4,534,094

METHOD OF MAKING AN INK ROLLER ASSEMBLY WITH CAPILLARY INK SUPPLY

John R. Kessler, 2060 D Sidneywood Dr., West Carrollton, Ohio 45449

Division of Ser. No. 322,463, Nov. 18, 1981, Pat. No. 4,399,751.
This application Aug. 4, 1983, Ser. No. 520,425
Int. Cl.³ B41F *1/46*
U.S. Cl. 29—148.4 D **7 Claims**



1. A method of producing an improved ink roller assembly adapted to provide a uniform application of ink over an extended period of use, comprising the steps of forming a plurality of generally circular thin discs each having a series of radially spaced and generally circumferentially extending capillary ink retaining chambers, arranging the discs in a stack to form a generally cylindrical ink retaining unit, inserting the ink retaining unit into a flexible sleeve of porous ink retaining material, forming on each of the discs a plurality of peripherally spaced and outwardly extending capillary passages connecting the corresponding chambers for directing a flow of ink from the chambers outwardly into the sleeve, and confining the ink retaining unit between a set of axially spaced flange members.

4,534,095
CAGE FOR ROLLING BEARINGS

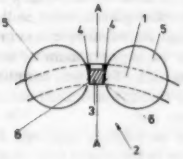
Armin Olschewski, Schweinfurt, and Bernhard Bauer, Hassfurt, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

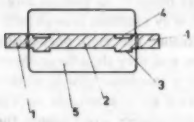
Filed Nov. 9, 1983, Ser. No. 550,300

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 8231303[U]

Int. Cl.³ B21H *1/12*

U.S. Cl. 29—148.4 C **1 Claim**





1. A method for holding rolling elements in a bearing cage of sheet metal in which cage pockets embracing the rolling elements are separated by webs, said method comprising stamping the outer surface of said webs at their centerlines to deform the material thereof to extend into said cage pockets at said outer surface and to deform the material thereof to form projections extending vertically from the inner surface of said webs, whereby the deformed material inhibits the rolling elements from falling out of the respective cage pockets.

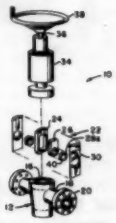
4,534,096
VALVE SEAT WITH TRAPPED O-RING

Frank Garcia, Jr., Spring, and David L. Brown, Houston, both of Tex., assignors to Vetco Offshore, Inc., Ventura, Calif.

Division of Ser. No. 444,565, Nov. 26, 1982, Pat. No. 4,492,392. This application Oct. 17, 1984, Ser. No. 661,634

Int. Cl.³ B23Q *5/00*; **B23C** *3/05*

U.S. Cl. 29—157.1 R **9 Claims**



1. A method of producing a groove in a valve seat part, said seat part having a hollow and generally cylindrical configuration about a seat axis, and having at one end a generally saddle-shaped eccentric surface adapted to conform to the contour of the inner surface of a cylindrical valve main bore when the seat is transversely oriented to the valve bore axis, said method comprising the steps of:

mounting the seat part in a four-axis horizontal milling machine system such that the valve seat part is affixed to a table adapted to rotate about a vertical axis B, said part being oriented in the table fixture such that the cylindrical axis of the part is perpendicular to and intersects with the B axis, and the perpendicular distance from the B axis to every point on the eccentric surfaace of the part is equal to the part radius R_P;

mounting an end mill tool on the machine such that the tool motion can be specified by a coordinate system having a horizontal (X) axis, a vertical (Y) axis, and a longitudinal (Z) axis, wherein the Z axis coincides with the axis of the seat part, the Y axis is parallel to the B axis, and the X,Y,Z axes are mutually perpendicular;

positioning the tool along the X axis until the tool contacts the valve seat eccentric surface at the desired groove radius R_G;

rotating the part about the B axis until the tool is perpendicularly oriented relative to the eccentric surface;

setting the tool motion along the Z axis for a constant depth of mill cut;

establishing a geometrical relationship between the desired radius R_G of the groove and the radius R_P of the saddle-shaped curvature, for controlling the tool movement along the Y axis and part rotation about the B axis, as the tool remains at a fixed X axis locaation and constant Z axis groove milling depth; and

operating the machine system such that a generally rectangular groove of constant width and depth is milled into the eccentric surface of the part, the groove sidewalls being substantially perpendicular to and the groove base being parallel with the eccentric surface.

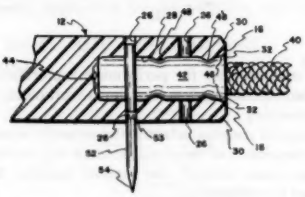
4,534,097
METHOD OF MAKING A POLICE RESTRAINT DEVICE

James R. Mason, Box 2321, Idaho Falls, Id. 83401

Division of Ser. No. 360,110, Mar. 19, 1982, Pat. No. 4,426,079. This application Oct. 13, 1983, Ser. No. 541,637

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—432.2 **3 Claims**



1. A method of making a restraint device for use in law enforcement comprising the steps:

providing two elongated handles capable of being held in the hand of the user;

causing a cavity to be fabricated in and exposed at one end of each handle;

providing a flexible cord of predetermined length comprising yieldable securely interrelated elongated segments;

anchoring the exterior of each end of the cord in a rigid hollow sleeve-like member;

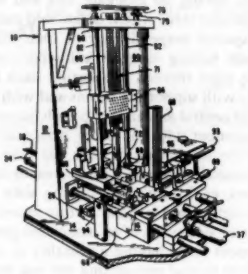
placing the two sleeve-like members, with cord end anchored therein, respectively snugly in the handle cavities;

inseparably securing both the sleeve-like member and the cord end within its associated handle cavity in each handle by placing pin means transversely through said cord segments at each cord end, through opposite locations in the sleeve-like members, and through opposite locations in each handle.

4,534,098
APPARATUS FOR APPLYING ASSEMBLED CONNECTOR TERMINALS AND THE LIKE TO A PLURALITY OF LEADS

Vincent B. Brown, Prospect Heights, and Donald G. Schreiner, Wheeling, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Division of Ser. No. 63,849, Aug. 6, 1979, Pat. No. 4,253,222.
This application Sep. 19, 1980, Ser. No. 189,293
Int. Cl.[3] B23P *19/02*; H01R *43/00*
U.S. Cl. 29—564.8 1 Claim



1. An apparatus for applying terminals to a plurality of leads including a clamping means for gripping and advancing said leads from a supply source toward a first terminal; means for bringing said terminal and said leads into electrically conductive engagement; and means for severing said leads into segments of predetermined length, the improvement comprising: lead lengthening probe means, said probe means being proportioned to transversely engage at least one of said leads at a position between its end and move it to a position transveresly of said direction of advancement, to lengthen the extent of said lead which is advanced beyond said severing means, said probe means includes a plurality of longitudinally separate segments which are longtudinally adjustable with respect to each other, said segments being retained together by a retainer member which is slidably mounted and adapted for motion in the longitudinal direction of said segments, said segments define a serrated surface facing said retainer member, said retainer member in turn defining an array of set screw members whereby said screw members of the guide member interract with the serrations to retain the vertical segments in the desired position, said retainer member provides a pair of longitudinally spaced set screw members for each vertical segment, the set screw members begin positioned so that when one set screw is positioned between a pair of serrations, the other set screw is positioned adjacent a peak of a serration.

4,534,099
METHOD OF MAKING MULTILAYER PHOTOELECTRODES AND PHOTOVOLTAIC CELLS

Arthur T. Howe, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 434,603, Oct. 15, 1982,. This application Sep. 18, 1984, Ser. No. 651,838
Int. Cl.[3] H01L *31/18*
U.S. Cl. 29—572 12 Claims

1. A process for the preparation of a multilayer structure which is suitable for use as either a photovoltaic cell or a photoelectrode in a photoelectrochemical cell which comprises:

(a) forming a layer of insulator material on an n-type semiconductor, wherein said insulator material is negatively charged as a consequence of the presence of aliovalent dopant ions and has a thickness which is effective to permit electron tunneling through it;

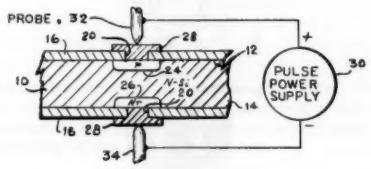
(b) forming a layer of conducting material on said layer of insulator material; and

(c) annealing the resulting structure.

4,534,100
ELECTRICAL METHOD OF MAKING CONDUCTIVE PATHS IN SILICON

Clyde H. Lane, Rome, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 28, 1982, Ser. No. 393,169
Int. Cl.[3] H01L *21/326*
U.S. Cl. 29—586 1 Claim



1. A method of making electrical conductive paths between opposite surfaces of a semiconductor substrate having a dopant therethrough comprising the steps of:

forming oxide layers on said opposite surfaces of said substrate;

forming a plurality of contact openings in said oxide layers by photolithography;

diffusing dopants into said substrate through said contact openings, a p-type dopant diffused into a first surface of said substrate, and an n-type dopant diffused into a second surface of said substrate, a concentration of a diffusing dopant exceeding said dopant of said substrate being of the same type;

removing diffusing dopants from said oxide layers and said substrate surfaces;

depositing selectively metal into said contact openings to form metal contacts;

connecting electrically a plurality of said metal contacts with strips of conductive material;

applying a current source across selected metal contacts;

causing breakdown current channels between said selected metal contacts with said current source whereby said metal of said metal contacts flows in said channels; and

removing said oxide layers, said strips, and said metal contacts.

4,534,101
METHOD OF INSTALLING SELF-LOCKING NUT AND BOLT ASSEMBLY

José Rosán, Jr., Newport Beach, Calif., assignor to Rexnord Inc., Brookfield, Wis.

Filed Jan. 27, 1982, Ser. No. 343,376
Int. Cl.[3] B23P *11/00*
U.S. Cl. 29—432 1 Claim

1. A method of securing at least two elements together with a fastener so as to resist separation by vibration and shock which comprises the steps of:

drilling a bore in one element to accommodate a fastener assembly at least flush with the outer surface of the outermost element, said fastener assembly comprising a threaded shaft and a driven portion having a transverse dimension greater than that of said threaded shaft, said driven portion including a longitudinal cylinder, a first retaining ring at one end of said cylinder, a second retaining ring at the opposite end of said cylinder, a serrated portion adjacent said second retaining ring, a locking ring having inside and outside serration and longitudinally

slidable along said driven portion from said first retaining ring to said second retaining ring, and a conical spring with the larger diameter adjacent said lock ring and the smaller diameter adjacent said first retaining ring;

serrating an area generally between one-quarter to one-half way up said bore;

screwing said fastener assembly into said bore;

engaging said driven portion with a tool means for suppressing said lock ring onto said spring which goes into compression, and engaging the lock ring into the serrated area of the bore;

torquing said driven portion to its lower limit; and

retracting an outer sleeve of said tool means and tightening said driven portion until said conical spring pushes said lock ring into a locking engagement with said serrated portion of said driven portion and the serrated area of said bore.

4,534,102

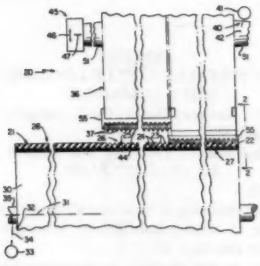
METHOD OF MAKING POLYMERIC BELT CUTTING APPARATUS

G. Brian Hetz, 1733 E. Holiday, Springfield, Mo. 65807

Division of Ser. No. 267,189, May 26, 1981, Pat. No. 4,496,269. This application Oct. 24, 1983, Ser. No. 544,929

Int. Cl.³ B29H *7/22*

U.S. Cl. 29—558 **5 Claims**



1. In a method of making an apparatus for cutting a non-contoured and cured polymeric belt sleeve to define an endless power transmission belt construction having a plurality of alternating annular belt projections and grooves; each of said grooves having a pair of symmetrical radially diverging side walls; said method comprising the steps of; providing a mandrel for supporting said belt sleeve for rotation about a longitudinal axis; providing means for rotating said mandrel and belt sleeve about said longitudinal axis; constructing a rotatable cutting instrument having axially spaced cutting projections for cutting said annular grooves with each of said cutting projections having integral cutting means for cutting an associated pair of said symmetrical side walls of an associated groove; providing means for rotating said cutting instrument; and providing means for moving said cutting instrument toward and away from said sleeve with said moving means being adapted to urge said cutting instrument during rotation thereof against the rotating belt sleeve to define said belt construction; the improvement in which said step of constructing said cutting instrument comprises, forming a first support body having a first central axis, defining a plurality of rake-like cutting bars each having an elongate axis and each having integral spaced parallel teeth which define said cutting projections and are disposed perpendicular to their elongate axis, each of said teeth having integral knife-like cutting edges defining opposite sides thereof, supporting each bar on said first support body with supporting means and with its elongate axis parallel to said central axis and with each bar on a common cylindrical arrangement with the other bars, said supporting step resulting in the supporting of each bar with each tooth thereof circumferentially aligned with corresponding teeth of the remaining bars, each tooth cooperating with said corresponding teeth to define said integral cutting means for cutting an associated pair of side walls of an associated groove, forming a second support body having a plurality of cutting bars each being identical to said one cutting bar and having a second central axis, each of said identical cutting bars of said second plurality being supported on said second support body on a common circumference and with the cutting means of each pair thereof in circumferentially aligned relation, providing a central support shaft, fixing said support bodies concentrically around and in side-by-side relation on said shaft with their central axes coaxially aligned on a common axis, angularly arranging said first-named plurality of rake-like cutting bars about said first support body with the same angular displacement therebetween, angularly arranging said second plurality of rake-like cutting bars also about said second support body with said same angular displacement therebetween, and disposing said first and second support bodies so that said second-named cutting bars are angularly displaced with respect to said first-named cutting bars.

4,534,103

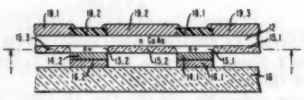
METHOD OF MAKING SELF-ALIGNED METAL GATE FIELD EFFECT TRANSISTORS

Alfred Y. Cho, Summit; Bernard Glance, Colts Neck, both of N.J.; Daniel Lubzens, Haifa, Israel, and Martin V. Schneider, Holmdel, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 119,313, Feb. 7, 1980, abandoned. This application Jun. 25, 1982, Ser. No. 392,286

Int. Cl.³ H01L *21/302*

U.S. Cl. 29—571 **5 Claims**



1. In a process for making a semiconductor device, the steps of:

(a) forming an opaque electrode on a first portion of a first major surface of a transparent semiconductor layer;

(b) oxidizing the semiconductor layer to a limited depth at a second, complementary portion of the major surface of the semiconductor layer;

(c) bonding said electrode onto a thin metal pad located on a major surface of a transparent insulating body; and

(d) directing optical radiation, through both the insulating

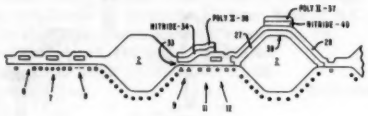
body and the oxidized portions of the semiconductor layer, to a positive photoresist layer located on a second opposed major surface of said semiconductor layer.

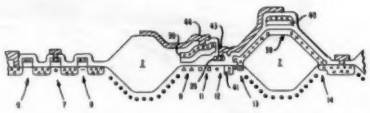
4,534,104

MIXED DIELECTRIC PROCESS AND NONVOLATILE MEMORY DEVICE FABRICATED THEREBY

Vinod K. Dham, Fremont, Calif.; Edward H. Honnigford, Dayton; John K. Stewart, Jr., West Carrollton; Robert F. Pfeifer, and Murray L. Trudel, both of Centerville, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 26, 1982, Ser. No. 352,734
Int. Cl.[3] H01L *21/22, 21/26*
U.S. Cl. 29—571 **7 Claims**





1. A process for fabricating volatile and nonvolatile field effect devices on a common semiconductor substrate, comprising the steps of:

separating a silicon substrate into distinct active regions;

doping selected areas in said active regions to adjust the respective threshold voltages;

forming a patterned first layer of semiconductor material on the substrate;

forming a first isolation dielectric layer;

patterning said first isolation dielectric layer to position a memory element;

forming a memory dielectric at the position of the memory element;

forming a second dielectric layer;

forming a second layer of semiconductor material;

patterning said second layer of semiconductor material and said second dielectric layer;

removing selected areas of said first isolation dielectric; and

doping selected areas of said substrate and semiconductor material layers.

4,534,105

METHOD FOR GROUNDING A PELLET SUPPORT PAD IN AN INTEGRATED CIRCUIT DEVICE

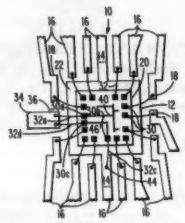
Raymond K. Reusch, Basking Ridge, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 10, 1983, Ser. No. 521,897
Int. Cl.[3] H01L *23/50, 23/12*
U.S. Cl. 29—589 **12 Claims**

1. In a method of grounding a mounting pad in an integrated circuit device to a ground finger which is electrically isolated from and adjacent said mounting pad, said device including: (1) an integrated circuit chip having a plurality of electrical components and two bond pads formed thereon, said integrated circuit chip being supported by said mounting pad and (2) a structural member attached to said mounting pad so that electrical continuity exists therebetween and arranged to support the weight of said mounting pad and said chip, said structural member being electrically isolated from said ground finger, the steps comprising:

(a) forming a metalized layer on said chip electrically connecting said two bond pads;

(b) attaching one end of a first connector wire to one of said two bond pads, and the other end of said first connector wire to said structural member; and



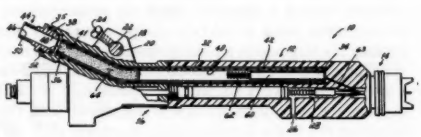
(c) attaching one end of a second connector wire to the other of said two bond pads, and the other end of said second connector wire to said ground finger; wherein each of said attaching effects ohmic connections.

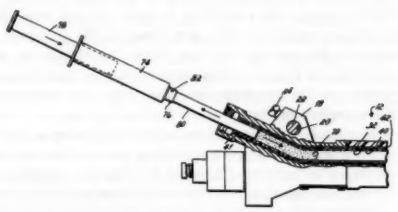
4,534,106

METHOD FOR REPLACING DIELECTRIC MATERIAL AT THE HIGH-VALUE RESISTOR OF AN ELECTROSTATIC SPRAY GUN TO PREVENT CORONA DISCHARGE

Richard M. Simashkevich, Lorain, and William J. Sharp, Wakeman, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 5, 1983, Ser. No. 539,086
Int. Cl.[3] H01C *17/02*
U.S. Cl. 29—613 **8 Claims**





1. A method of replacing spent dielectric material at the resistor of an electrostatic spray gun to prevent corona discharge comprising the steps of:

inserting an insulating tube within a bore formed in said spray gun, said insulating tube having a smaller outside diameter than the inside diameter of said bore forming a gap therebetween;

positioning a resistor within said insulating tube, said resistor being encapsulated with a first slug of dielectric material;

dispensing a new slug of said dielectric material within said insulating tube;

inserting a high voltage cable into said insulating tube so as to force said new slug of dielectric material ahead of said cable, said new slug of dielectric material encapsulating

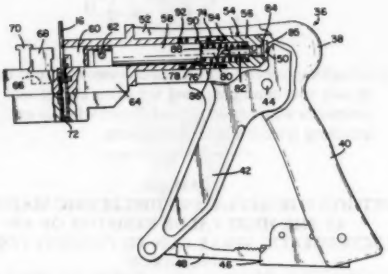
said resistor and forcing at least a portion of said first slug of dielectric material into said gap between said insulating tube and said bore.

4,534,107

WIRE INSERTION AND TERMINAL CRIMPING TOOL

Werner Maack, Seeheim, Fed. Rep. of Germany, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 9, 1984, Ser. No. 587,753
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—751 **7 Claims**



1. An inserting and crimping apparatus for inserting a wire into the wire-receiving slot of an electrical terminal and simultaneously crimping the U-shaped insulation support portion of the terminal onto the wire, the wire having a diameter which lies within a predetermined range, the force required to crimp the insulation support portion being substantially equal to F for all wires having a diameter within the predetermined range, the apparatus being of the type comprising a work holder for holding the terminal in a predetermined position, a ram which is reciprocable along a rectilinear path towards and away from a terminal in the work holder, a wire positioner on the path for holding the wire with its axis in alignment with the wire-receiving slot in the terminal and in alignment with the insulation support portion, an inserter on the ram for moving the wire onto the wire-receiving slot, a crimping die on the ram which crimps the insulation support portion onto the wire during movement of the ram towards the terminal, and an actuator for moving the ram along the rectilinear path and applying the force F required to crimp the insulation support portion of the terminal onto the wire, the apparatus being characterized in that:

the ram is a composite member comprising a tool holder portion and a force transmitting portion which is in alignment with the tool holding portion, the crimping die and the inserter being on the tool holder portion, the actuator being in engagement with the force transmitting portion and being effective to move the actuator portion along the rectilinear path,

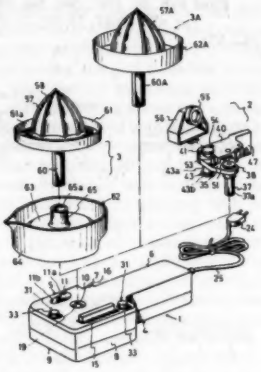
a force transmitting compressible coupling is provided between the tool holder portion and the force-transmitting portion, the coupling being compressible upon application thereto of the force F required to crimp the insulation support portion onto the wire and being substantially incompressible under a force which is less than F whereby during insertion of a wire into the wire-receiving slot of the terminal and crimping of the insulation support portion of the terminal onto the wire, the resilient coupling will be compressed to an extent which will depend on the diameter of the wire, the extent of compression being greater for a larger diameter wire than for a smaller diameter wire.

4,534,108

ELECTRIC CAN OPENER WITH JUICE SQUEEZING ATTACHMENT

Osamu Yamamoto, Nagoya, and Senichiro Norizuki, Aichi, both of Japan, assignors to Kabushikikaisha Aichidenkikosakusho, Japan

Filed Sep. 2, 1983, Ser. No. 528,914
Claims priority, application Japan, Sep. 6, 1982, 57-154898
Int. Cl.³ B25F *3/00*; B67B *7/38*; A47J *19/02*
U.S. Cl. 7—152 **4 Claims**



1. An electric can opener including

(i) a can opener body, and

(ii) a can opening attachment

said can opener body including

(a) a housing having a work surface on one surface thereof,

(b) a drive shaft mounted in such a way that the drive shaft is rotatable with respect to said housing, and is partly exposed to the work surface, wherein the work surface is bored with a mounting hole, said mounting hole including a large diameter hole portion and a small diameter hole portion formed laterally of and continuous to said large diameter hole portion, said small diameter hole portion being positioned, with respect to the large diameter hole portion, on the side where said drive shaft is rotated,

(c) a motor provided within said housing and associated with said drive shaft,

(d) a vertically holding portion for positioning said housing so that said drive shaft assumes a horizontal condition, said vertically holding portion being provided in a part of the housing, and

said can opening attachment including

(e) a base plate, a horizontal rotating shaft rotatably mounted on said base plate, a mounting shaft is projected from a surface of the base plate opposed to said work surface, and the distance from said horizontal rotating shaft to the mounting shaft is made equal to the distance from the drive shaft in said can opener body to said mounting hole, said mounting shaft including a small diameter portion on the base plate side and a large diameter portion on the forward end side thereof, said small diameter portion being reduced in diameter as compared with that of the small diameter hole portion so that the small diameter portion may be moved laterally towards the small diameter hole portion after the former has been passed through said large diameter hole portion, said large diameter portion being reduced in diameter as compared with that of said large diameter hole portion but increased in diameter as compared with that of said small diameter hole portion so that when said small diameter portion is moved laterally

from the large diameter hole portion towards the small diameter hole portion, said large diameter portion is moved towards a deep portion of the small diameter hole portion to prevent the mounting shaft from being slipped out of the mounting hole,

(f) a can feed gear mounted on said rotating shaft, said can feed gear being adapted to place an ear of a can thereon, and

(g) a cutter slidably mounted on said base plate, said cutter being adapted to cut into a can lid of the can whose ear is placed on said can feed gear.

4,534,109

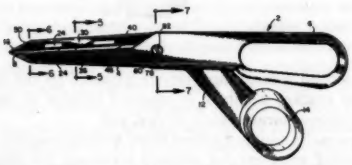
SCISSORS

Thomas J. Bush, Canton Center, Conn.; Charles L. Dellinger, Statesville, and Gerald P. Fregeolle, Hickory, both of N.C., assignors to Hunt Manufacturing Co., Philadelphia, Pa.

Filed Sep. 19, 1983, Ser. No. 533,460

Int. Cl.³ B26B *13/00, 13/12, 13/06*

U.S. Cl. 30—260 **5 Claims**



1. In a scissors having first and second arms with each arm having a finger receiving portion at one end, the improvement comprising:

a removable metal blade having an outer edge and an inner cutting edge for each arm,

the outer edge of each blade having a pair of openings, each opening having a forwardly extending nose portion and a sloping rear portion,

a flange on each arm abutting the outer edge of the blade of each arm,

a pair of inward projections on each flange, each having a forwardly extending nose portion and a sloping rear portion, engaging the openings in the outer edge of the blade of each arm,

a finger extending inwardly from the forward end of each flange and overlying a portion of the blade of each arm, and

pivot means passing through the arms and blades for securing the arms and blades together.

4,534,110

TRIPLE-EDGE SAFETY RAZOR AND BLADE

Henry P. Glass, Northfield, Ill., assignor to David Mall, Chicago, Ill.

Filed Dec. 28, 1982, Ser. No. 453,838

Int. Cl.³ B26B *21/20*

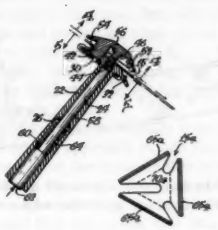
U.S. Cl. 30—346.57 **5 Claims**

1. A blade assembly for use in a triple-edge safety razor comprising:

three individual blades; and

a flexible central web interconnecting said blades in triangular relationship, said central web providing a flexible connection between said blades;

said triangular blade assembly defining an elongated aperture having an open end at a location adjacent to one apex of said triangular blade assembly and between the ends of a pair of the individual blades and extending substantially through the flexible central interconnecting web to a closed end at substantially the center of said triangular blade assembly to define an open ended notch adapted to permit sliding insertion and removal of the triangular



blade assembly from a triple-edge safety razor without disassembly thereof.

4,534,111

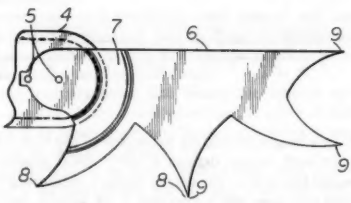
COMBINED CHAIN SAW AND POSITIONING TOOL

Thomas Eistrat, 1020 S. Almansor St., Alhambra, Calif. 91801

Continuation-in-part of Ser. No. 182,377, Aug. 29, 1980, abandoned. This application Dec. 24, 1981, Ser. No. 334,414

Int. Cl.³ B23D *59/00*

U.S. Cl. 30—371 **4 Claims**



1. A portable bar type chain saw combined with a work positioning device, comprising:

a motor; for driving

a chain; on a

guide bar having an end attachable to the motor and a front end; and a work positioning device connected to the guide bar generally near the front end thereof and projecting generally forwardly therefrom, the work positioning device having at least one hook thereon at a position beyond the front end of the guide bar so that the chain saw combined with the work positioning device may be used for cutting as a chain saw, or for a tool function of moving, pushing, or pulling one or more objects out of the way of a workpiece to be cut before cutting the workpiece; or for moving, pushing, or pulling a workpiece, such as firewood that is unreachable for safely cutting with a chain saw not having an attachment of the work positioning device but is reachable with attachment of the work positioning device for movement into a safer and unoverreached position before cutting the workpiece with the chain saw; and means for combining the work positioning device with the guide bar for the work positioning device tool function.

4,534,112

ANTI-KERF BIND DEVICE

David L. Bass, 3201 Martin Johnson, Chespeake, Va. 23323

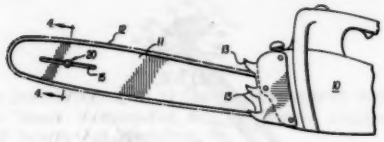
Filed Mar. 18, 1983, Ser. No. 476,793

Int. Cl.³ B27B *17/00, 21/00*

U.S. Cl. 30—383 **6 Claims**

2. A woodcutting implement having cutting teeth on at least one edge of a metal bar, a slot formed in said bar, and a wheel

assembly/comprising a pair of opposing, spaced wheels secured to their respective end portions of a stub shaft which has



been mounted in said slot, the inner surface of each wheel being in slidable contact with the adjacent, respective bar surface.

4,534,113

LENGTH MEASURING APPARATUS

Siegbert Hoistein, Stein a.d. Traun, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 18, 1984, Ser. No. 572,167

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1983, 3302151

Int. Cl.³ G01B *11/04*

U.S. Cl. 33—125 R **12 Claims**

1. In a length measuring apparatus of the type comprising a carrier body which defines a longitudinal groove extending between the ends of the carrier body, a measuring band which defines two ends and is disposed in the groove, and a scanning unit guided for movement along the measuring band to scan the measuring band and thereby measure the relative position of the scanning unit with respect to the measuring band, said scanning unit occupying a scanning volume as it moves along the measuring band, the improvement comprising:

means for fastening one end of the measuring band to one end of the carrier body; and

means for fastening the other end of the measuring band to the other end of the carrier body;

at least one of the fastening means shaped and positioned to remain entirely outside of the scanning volume and thereby to allow the scanning unit to move past said at least one of the fastening means, past the associated end of the carrier body, without disassembly of said at least one of the fastening means.

4,534,114

COUPLING ALIGNMENT SYSTEM

Joseph T. Woyton, Mauldin, and George G. Grant, Greer, both of S.C., assignors to Reliance Electric Company, Greenville, S.C.

Filed Apr. 9, 1984, Ser. No. 598,082

Int. Cl.³ G01B *3/30*

U.S. Cl. 33—181 R **18 Claims**

1. A coupling alignment system for use in aligning rotatable shaft members connected by a shaft coupling, comprising, in combination:

a. first and second coupling hubs for mounting on the opposed ends of the shaft members, each having an attachment site,

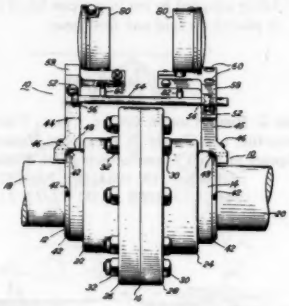
b. a first bracket member for mounting on said first hub,

c. a second bracket member for mounting on said second hub,

d. a fastening means for securing said bracket members to said hubs at the respective attachment site,

e. an extension means projecting from each of said bracket members to the opposed bracket member for contact therewith,

f. a first measurement device mounted on one of said bracket members for indicating the degree of deflection of said extension means relative to the opposed bracket member,



g. a second measurement device mounted on the other of said bracket members in opposed relation to said first mentioned measurement device, and

h. a pivotally mounted swivel block mounted on each of said bracket members for slidably receiving the respective extension means.

4,534,115

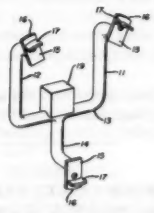
VEHICLE WHEEL LOCATION DEVICE

Dan Kashubara, 8803 N. Palmyra Rd., Canfield, Ohio 44406

Filed Dec. 30, 1982, Ser. No. 454,845

Int. Cl.³ G01B *5/255, 11/275*

U.S. Cl. 33—203.18 **5 Claims**

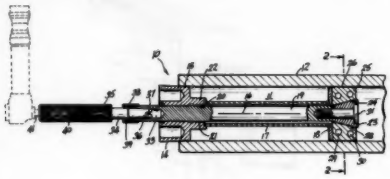


1. A device for locating tire and rim assemblies on vehicle wheels on a right angular plane to the axis of a vehicle's axle comprising a vertically disposed mounting structure having at least three outwardly extending body members, vertically disposed mounting plates secured to the free ends of said body members, the outermost ends of said mounting plates being curved and beveled, arcuate brackets on said mounting plates inwardly of the outermost ends thereof for engagement over said wheel, a light beam generating source secured centrally of said mounting structure arranged to project said light beam axially of said wheel, target means for indicating the position of said light beam thereon so that proper alignment of the tire and rim assembly relative to the axle can be made, said target means imcluding a vertical target and movable indicator on said target.

4,534,116
ADAPTER FOR BORESIGHT TELESCOPE

James E. Davis, Lake Park, Fla., assignor to Lenzar Optics Corporation, Riviera Beach, Fla.

Filed Aug. 26, 1983, Ser. No. 526,704
Int. Cl.³ F41G 1/54
U.S. Cl. 33—234 4 Claims

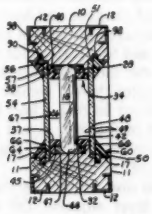


1. A bore sighting instrument comprising a muzzle end adapter having a frustro-conical outer periphery adapted to be inserted into the muzzle end of a barrel, said adapter having a central bore receiving a central shaft therethrough, said central shaft being threadably coupled to said adapter, a sleeve affixed to said adapter and coaxially disposed about said central shaft and adapted to be inserted into a barrel, a radially expandable member, said expandable member comprising a plurality of rigid finger members equiangularly disposed about the axis of said central shaft and secured together by an elastomeric material, said fingers having parallel outer edges adapted to engage the inner periphery of a barrel, said fingers having inner edges equally inclined to the axis of said central shaft, an expander member having a frustro-conical periphery engaging the inner edges of said fingers, said expander member being coaxially attached to said central shaft, a radially extending plate member affixed to the end of said sleeve and providing a surface in engagement with vertical edges of said fingers, whereby when said central shaft is rotated in one direction on said threaded connection with said muzzle end adapter, said expander member forces said fingers radially outwardly into engagement with the inner periphery of said barrel.

4,534,117
SPIRIT LEVEL

LeRoy H. Haefner, Edmond, and Stephen M. Rhodes, Mustang, both of Okla., assignors to Macklanburg-Duncan Company, Oklahoma City, Okla.

Filed Apr. 15, 1983, Ser. No. 485,239
Int. Cl.³ G01C 9/28; E06B 3/00
U.S. Cl. 33—379 12 Claims



2. An elastomeric annular gasket for sealing and holding a transparent plate across an opening into which said plate is countersunk to close the opening, while facilitating viewing through the opening, said gasket comprising:

an annular body of elastomeric material having a central opening therethrough, and further including:

a first substantially monoplanar side adapted to contact said plate;

a second side at the radially outer side of said annular body and intersecting said first side at substantially a right angle and having an edge spaced from its line of intersection with said first side;

a third, radially inner side facing the central opening through the body and intersecting the plane of said first side at an acute angle;

an annular sealing lip at the radially inner edge of said first side at its nearest approach to said third side, and lying predominantly on the opposite side of the plane of said first side from the remainder of the annular body, and adapted to be resiliently, sealingly deflected into the plane of said first side when said first side is placed in contact with said plate; and

a second annular sealing lip at said edge of said second side at its nearest approach to said third side, and adapted to be resiliently, sealingly deflected into alignment with said second side when said second side is placed in contact with the surface forming the opening.

6. An elastomeric annular gasket for sealing and holding a transparent plate across an opening into which said plate is countersunk to close the opening, while facilitating viewing through the opening, said gasket comprising:

an annular body of elastomeric material having a central opening therethrough, and further including:

a first substantially monoplanar side adapted to contact said plate;

a second side at the radially outer side of said annular body and intersecting said first side at substantially a right angle and having an edge spaced from its line of intersection with said first side;

a third, radially inner side facing the central opening through the body and intersecting the plane of said first side at an acute angle, and further extending at an acute angle to said second side;

an annular sealing lip at the radially inner edge of said first side at its nearest approach to said third side, and lying predominantly on the opposite side of the plane of said first side from the remainder of the annular body, and adapted to be resiliently, sealingly deflected into the plane of said first side when said first side is placed in contact with said plate; and

a second annular sealing lip at said edge of said second side at its nearest approach to said third side, and adapted to be resiliently, sealingly deflected into alignment with said second side when said second side is placed in contact with the surface forming the opening; and

an annular flange around said annular body of elastomeric material and projecting radially outwardly from said second side for engaging the gasket in an annular groove to thereby retain the gasket in sealing contact with said plate.

4,534,118
SOLAR-ASSISTED MOBILE FOOD DEHYDRATOR

Marcello M. Cabus, Hotchkiss; Billy D. Howard, Delta; James W. Colt, and Edward S. Tuft, both of Hotchkiss, all of Colo., assignors to Sun-Flo International, Inc., Hotchkiss, Colo.

Filed Aug. 30, 1982, Ser. No. 412,932
Int. Cl.³ F26B 21/08
U.S. Cl. 34—34 34 Claims

1. A food dehydration machine comprising:

an intake chamber to receive an inlet gas stream;

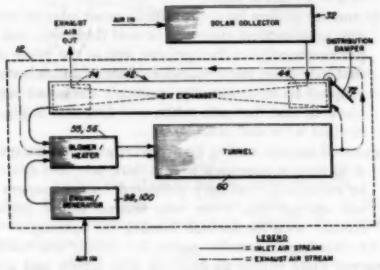
heating means connected to said intake chamber for heating the inlet gas stream, said heating means comprising heat exchanger means for preheating the inlet gas stream using the energy from an exhaust gas stream, and a heater to heat the inlet gas stream;

blower means for accelerating the inlet gas stream;

drying tunnel means connected to said intake chamber for containing food to be dehydrated and for receiving the

heated inlet gas stream and allowing the inlet gas stream to contact the food, the gas stream after contacting the food becoming the exhaust gas stream; and

recirculation means connected to said drying tunnel means and said heat exchanger means for dividing the exhaust gas stream into two separate parts, a variable portion and



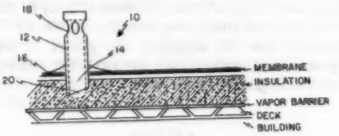
a remainder, and for returning the variable portion to mix with the inlet gas stream to be reheated and re-accelerated and directing the remainder to said heat exchanger means, said recirculation means including means for adjusting the relative sizes of the variable portion and the remainder in accordance with a parameter of the gas stream.

4,534,119

APPARATUS AND METHOD FOR DRYING INSULATION

Leon R. Glicksman, Lynnfield, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 22, 1983, Ser. No. 506,574
Int. Cl.³ F26B *13/26*
U.S. Cl. 34—95 **17 Claims**



1. An apparatus for drying insulation after installation comprising:

(a) a penetrating means for creating a passageway between the space occupied by the insulation and an exterior environment where unwanted moisture can be carried away by evaporation; and

(b) wicking means within the passageway for transporting moisture by capillary action from the insulation to the external environment; and

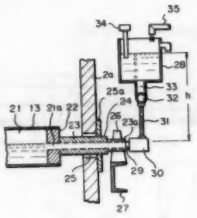
wherein the penetrating means is a hollow device adapted to receive the wicking means within itself and having at least one opening through which the wicking means may contact the insulation and further having at least one other opening through which moisture may evaporate from the wicking means to the external environment.

4,534,120

DRYER FOR A CONTINUOUS TEXTILE FABRIC

Narukazu Okazaki, Wakayama, Japan, assignor to Wakayama Iron Works, Ltd., Wakayama, Japan

Filed Nov. 2, 1983, Ser. No. 547,872
Int. Cl.³ F26B *13/18*
U.S. Cl. 34—119 **14 Claims**



1. A dryer for a continuous textile fabric, comprising:

a housing for defining a drying chamber for a continuous textile fabric, having an entrance and an exit for said fabric;

means for introducing said fabric into said drying chamber through said entrance;

means for delivering said fabric from said drying chamber through said exit;

a plurality of guide rolls for said fabric, arranged in said drying chamber in such a manner that a zigzag path for moving said fabric through the guide rolls is formed; and

a plurality of heat-radiating plates, arranged in said drying chamber between the sequent guide rolls and facing the moving path of said fabric, each guide roll having a hollow formed thereinside and connected through a conduit to a water tank, said water tank being located outside of said housing at a level above the level of said guide rolls, the water tank being open to the atmosphere outside of said housing, and said hollows, conduit and water tank providing means for preventing said guide rolls from overheating due to said heat-radiating plates.

4,534,121

INSOLE WITH CONCENTRIC CIRCULAR HEEL STRUCTURE

James C. Autry, Dallas, Tex., assignor to Autry Industries, Inc., Dallas, Tex.

Filed Jan. 16, 1984, Ser. No. 570,967
Int. Cl.³ A43B *21/26*
U.S. Cl. 36—35 R **3 Claims**

1. An insole for disposal between the sole in a shoe, comprising:

a layer of cushioning material for absorbing the shock between the foot and the shoe and having a first surface for being disposed adjacent the sole of the foot and a second surface opposite said first surface for being disposed adjacent the sole of the shoe and generally having a profile around the perimeter thereof similar to that of the foot, said cushioning layer having a heel portion for disposal adjacent the heel of the foot, a mid portion for disposal adjacent the arch of the foot, and a toe portion for disposal adjacent the toes of the foot;

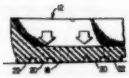
a cylindrical shaped disc formed on the second surface of said cushioning layer adjacent the center of said heel portion for providing cushioning to the central portion of the heel to the foot;

a plurality of annular ridges formed on said second surface in the heel portion adjacent said cylindrical-shaped disc, the radial centers of said annular ridges coinciding with the center of said heel portion and said cylindrical shaped disc; and

a plurality of arcuate ridges formed on said second surface in

said mid portion, and arcuate ridges forming a plurality of arcs of concentric circles with the progressing radii centered in the middle of said heel portion;

said cylindrical disc, said annular ridges, and said arcuate ridges having essentially equal heights from the second



surface of said cushioning layer and having a space between adjacent sides thereof at least equal to the width thereof such that compression of said ridges and said cylindrical disc does not result in contact between the sides thereof.

4,534,122

FIT AND SUPPORT SYSTEM FOR SPORTS FOOTWEAR

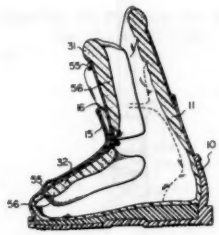
David M. MacPhail, Whistler Mountain, Canada, assignor to Macpod Enterprises Ltd., Squamish, Canada

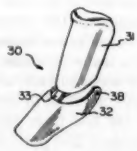
Filed Dec. 1, 1983, Ser. No. 556,939

Claims priority, application Canada, Dec. 1, 1982, 416815

Int. Cl.³ A43B *7/14*

U.S. Cl. 36—88 **26 Claims**





21. A support for sports footwear comprising a body of material shaped and dimensioned to fit within the footwear and to bear evenly against the dorsal surface of the foot, including the medial and lateral aspects thereof, forwardly and clear of the ankle joint so as not to restrict dorsiflexion of the foot at the ankle joint within the normal range while covering a majority of the mid-foot bones, and to occupy substantially all free space between said dorsal surface and an adjacent inner surface of the footwear, the material being sufficiently firm and unyielding to transmit pressure constantly during use from said adjacent inner surface of the footwear to the wearer's foot in order to substantially reduce articulation of said mid-foot bones and to substantially eliminate upward movement of said bones relative to the footwear.

4,534,123

CROSS-COUNTRY OR TOURING SKI BOOT AND METHOD OF MANUFACTURE

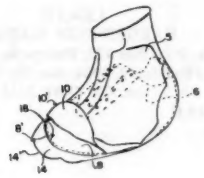
Georges P. J. Salomon, Annecy, and Jean-Paul Vinay, Roybon, both of France, assignors to Salomon S.A., Annecy, France

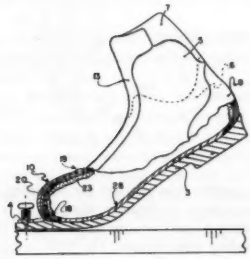
Filed Feb. 2, 1982, Ser. No. 344,943

Claims priority, application France, Feb. 6, 1981, 81 02728

Int. Cl.³ A43B *13/14, 5/04, 5/16*

U.S. Cl. 36—99 **36 Claims**





1. A boot for housing a leg and a foot of a wearer having a malleoli, wherein said boot comprises a first upper having a vamp and a second upper having a quarter, said first upper being adapted to encase the foot only below the malleoli of the wearer, said second upper encasing said first upper and extending upwardly to secure the base of the leg, said first and second uppers being secured to a sole of said boot, wherein said quarter of said second upper is stitched to said vamp of said first upper.

4,534,124

SPRING-ACTION RUNNING AND JUMPING SHOE

Joachim Schnell, Amselweg 7, D-6348 Herborn 4, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,612

Claims priority, application European Pat. Off., Sep. 14, 1982, 82108456.3

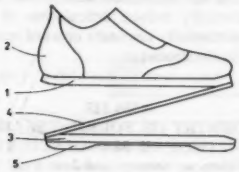
Int. Cl.³ A43B *13/18, 5/06*

U.S. Cl. 36—114 **10 Claims**

1. A spring-action athletic shoe comprising a shoe to be worn on the foot; an upper sole attached beneath the shoe; a lower sole spaced separate from and beneath the upper sole; the upper sole and the lower sole both having a front and rear end generally at the front and rear ends of the shoe; and both

ends of said lower sole are adapted for being pressed upon the ground as the shoe is used;

a leaf spring for elastically connecting the upper and lower soles; the leaf spring being generally of the width of the



shoe; the leaf spring having one end attached to one of the front and rear of the upper sole and having an opposite other end which is attached to the other of the front and rear of the lower sole.

4,534,125

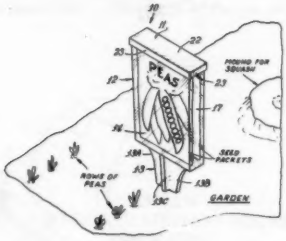
GARDEN ROW MARKER

David J. Buck, P.O. Box 177, Enterprise, Miss. 39330

Filed Jul. 9, 1984, Ser. No. 629,055

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—10 C **10 Claims**



1. A garden row marker for retaining informational materials concerning vegetation planted in a garden, said marker comprising a transpicuous hollow body integrally formed with a depending stake means, the hollow body having an interior display chamber for retaining informational materials to be visible to the gardener, said display chamber being defined by a plurality of continuous planar sidewalls therearound and integrally formed at lower edges thereof with a bottom wall defining the bottom of the display chamber, said sidewalls having a continuous top edge circumscribing an upward opening of said display chamber, the sidewalls including a peripheral lip extending outwardly generally around the top edge thereof, and a removable solid cap having means for resiliently-engaging said hollow body portion at said sidewall peripheral lip, whereby said display chamber is sealable to enable informational materials to be safely stored therein for use in a garden.

4,534,126

CHECK-OUT COUNTER DIVIDER

Harry Gilman, 8 Rose Ave., Marblehead, Mass. 01945

Filed Mar. 19, 1984, Ser. No. 590,803

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—19 **8 Claims**

1. A check-out counter divider comprising:

an elongated hollow body defining an elongated opening and having a plurality of planar faces; said faces being at least partially transparent to visible light;

advertising material positioned within said opening and visible through said faces;

removable closures on each end of said body to facilitate insertion and removal of said advertising material from within said opening, said closures being made of a skid-resistant material to prevent rolling or displacement of said divider; and

a shiftable weight disposed within said opening to prevent rolling or displacement of said divider.

4,534,127

DEVICE FOR A CASTING FLOAT

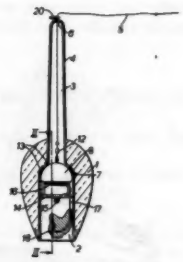
Sverre L. Thorvaldsen, Struervein 11 B, 1700 Sarpsborg, Norway

Continuation-in-part of Ser. No. 237,158, filed as PCT NO 80/00024 Jul. 11, 1980, published as WO 81/00186, Feb. 5, 1981, § 102(e) date Feb. 17, 1981, abandoned. This application Jan. 13, 1984, Ser. No. 570,582

Claims priority, application Norway, Jul. 24, 1979, 792436

Int. Cl.³ A01K *93/00, 97/04*

U.S. Cl. 43—41.2 **11 Claims**

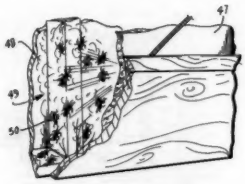


1. A casting float device having a float body with a passageway through which a fishing line may run and a chamber which is open to a lower surface of the float boat and which is continuous with the passageway, the chamber being dimensioned so that it houses a sinker and a fishing tackle, in which the sinker and fishing tackle leave the chamber when the casting float has arrived at the water surface, and in which a stop is attached to the line above the float to prevent more than a predetermined length of the line from passing through the passageway, the sinker having a first portion in the shape of a spool and a second portion attached to the end of the line, the sinker having external dimentions which match the chamber so that the sinker is placeable inside the chamber before the cast is made, and a snell connecting the sinker to the fishing tackle, the sinker being configured so that the snell is windable on to the sinker and so that the snell remains so wound during casting, the first portion of the sinker being hollow, and the second portion of the sinker being filled with a dense material.

4,534,128
METHOD FOR PEST CONTROL USING ANESTHETIC AND INSECTICIDE

Grady W. Query, 1725 Mint Hill Rd., Matthews, N.C. 28105; O. Grady Query, 14 N. Adgers Wharf, Charleston, S.C. 29401, and H. Fred Kessler, 1722 E. 8th St., Charlotte, N.C. 28204

Filed Feb. 1, 1983, Ser. No. 451,810
Int. Cl.[3] A01M *7/00*
U.S. Cl. 43—132.1 2 Claims



1. A method of treating insects or pests, comprising:
a. combining an insecticide and an anesthetic into a mixture as follows:

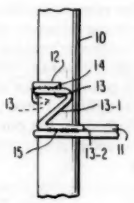
Pyrethrins I and II	.5 to .7%
Piperonyl Butoxide (Technical)	5%
Petroleum Oil, Refined	14%
Methylene Chloride	15%
Dimethyl Ether	65.3 to 65.5%
	100%

where the percentages indicated are by weight; and
b. injecting said mixture into a nest or dwelling place of said insects or pests whereby said anesthetic immobilizes said insects or pests while said insecticide acts to kill said insects or pests.

4,534,129
PLANT SUPPORT

William C. Stuckey, 1503 Virginia St. E., Charleston, W. Va. 25311

Filed Oct. 31, 1983, Ser. No. 547,534
Int. Cl.[3] A01G *17/06*
U.S. Cl. 47—47 6 Claims

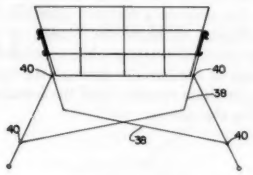


1. A wire plant support for use with a post in the ground comprising, in combination,
a plant support wire loop having a pair of terminal ends,
at least a first one of said terminal ends of said wire loop being formed as a projection for entering said post, means for permanently securing a second terminal end of said wire to said first one of said terminal ends near said projection to prevent movement relative to each other,
a pair of reaction bearing cross pieces near each end of said wire and integral therewith, each of said reaction bearing cross pieces being below the level of the point of entry of said post by said projection, said pair of reaction bearing cross pieces being secured together to prevent movement relative to each other,
integral link members maintaining the spaced relation between said reaction bearing members and the point of entry of said post by said projection,
said means securing said second terminal end of said wire to said first one of said terminal ends with the spacing between the tip of said projection and said pair of reaction bearing cross pieces being sufficient to permit the tip of said end and said reaction bearing members to be slid over said post to a desired position with said wire loop at an angle to the horizontal and then pivoted about said reaction bearing cross pieces to cause entry of said projection into said post with said wire loop in a substantially horizontal position.

4,534,130
FLOWER TOTE

William S. Rogers, 3393 Sewell Mill Rd., Marietta, Ga. 30062

Filed Sep. 29, 1982, Ser. No. 428,058
Int. Cl.[3] A01G *9/02*
U.S. Cl. 47—66 10 Claims



1. A basket for carrying and displaying, comprising:
(a) a plurality of intermeshed wires forming a bottom and sides of said basket;
(b) at least two spring clips disposed on opposing sides of said basket, each of said spring clips comprising a downwardly opening spring member;
(c) at least two handles, each having a first end adapted to be resiliently engaged by and freely removable from a respective one of said spring clips in a first and a second stable position, and a second end, said second end serving as a tote handle when disposed above said basket in said first stable position and as a stand to support said bastet when in said second stable position, each of said handles being rotatable, when engaged in its respective spring clip, between said first and second positions;
(d) means for restraining said handles when in said second stable position for preventing said handles from rotating towards said first stable position; and
(e) wherein said handles are generally in the form of a trapezoid and further comprise a stabilizing bar; said bar being connected between said first and second ends when said handles are in said first position and being interconnected between said handles when said handles are in said second position, whereby said handles are prevented from spreading apart in said second position.

4,534,131
REVOLVING DOOR SECURITY SYSTEM

Michael D. Blackston, Brooklyn Park, and Gary Reinecke, Moundsview, both of Minn., assignors to Heise Manufacturing, Minneapolis, Minn.

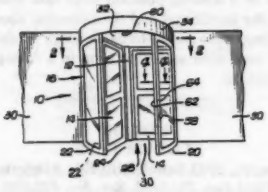
Filed Oct. 31, 1983, Ser. No. 546,827
Int. Cl.[3] E05D *15/02*
U.S. Cl. 49—42 12 Claims

1. In a powered reversible revolving door system having curved sidewalls and a door defined by a plurality of wings extending radially from a central axis, the wings defining a plurality of sectors, a method of preventing the unauthorized passage of an intruder through the system in one direction into a secured area without trapping an authorized passenger pres-

ent in the system attempting to pass through the system in the other direction, including the steps of:

detecting the presence of the intruder entering a door sector to pass through the door in an unauthorized direction,

stopping the rotation of the door before the intruder has free passage into the secured area,



means automatically and alternately rotating the door in a reverse direction to force the intruder backwards and then rotating the door in a forward direction, said rotations being sufficient to allow the escape of the authorized passenger out of the system while simultaneously preventing passage of the intruder through the door, and

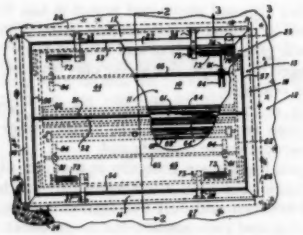
continuing alternate rotation until the intruder is no longer detected in the system.

4,534,132

SPRING ASSISTED DOORS FOR SIDEWALK, PIT AND FLOOR OPENINGS

Russell D. Smith, Hacienda Heights, Calif., assignor to Red Plastic Co., Inc., Cudahy, Calif.

Filed Aug. 19, 1983, Ser. No. 524,547
Int. Cl.³ E05F 1/10
U.S. Cl. 49—386 **9 Claims**



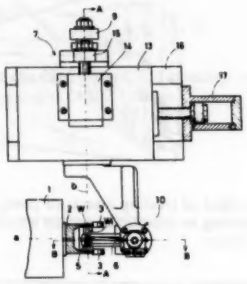
1. In a horizontal door assembly in which doors swing open upwardly urged by adjustable springs to give access to a vertical shaft the combination comprising a shaft head, said shaft head having a surrounding support collar, a frame secured in the support collar, a pair of doors extending horizontally across said frame in closed position, hinges having horizontal pivot pins securing an edge of each door to said frame, a fixed spindle mounted to said frame adjacent an outer edge of each door parallel to the pivot pins of said hinges, a winding bushing rotatable on said spindle, means on said bushing for receiving an adjusting bar, a helical spring supported on said spindle and secured to said winding bushing for rotation thereby to adjust the torque load of said helical spring, a spring limb extending from an end of said helical spring remote from said winding bushing, a spring limb end bearing against each door so as to exert a lift force thereon, and means for securing each winding bushing with respect to a fixed spindle.

4,534,133

MACHINE FOR SUPERFINISHING ANNULAR WORKPIECES

Teruo Matsuda, and Kizo Kawaguchi, both of Osaka, Japan, assignors to Osaka Seiki Kabushiki Kaisha, Ikeda, Japan

Filed Dec. 12, 1983, Ser. No. 560,404
Claims priority, application Japan, Dec. 22, 1982, 57-233000
Int. Cl.³ B24B 9/00
U.S. Cl. 51—58 **6 Claims**



1. A machine for superfinishing the inner race surface of an annular workpiece rotating in a plane about a center spindle axis, said machine comprising:

a holder arm for holding two honing stones of different grain size in juxtaposed positions within the plane of rotation of the workpiece adjacent the inner race surface of the workpiece;

first means for reciprocally arcuately moving said holder arm in a first direction generally perpendicular to the plane of rotation of the workpiece;

second means for moving said holder arm in a second direction generally perpendicular to said spindle axis toward and away from the inner race surface;

a lever mounted on said holder arm selectively engagable with either of said two honing stones for pressing the selected honing stone in said second direction toward and against the inner race surface;

means for selectively positioning said lever adjacent said selected stone; and

means for adjusting the relative positions of said holder arm and the workpiece in the direction of juxtaposition of the two honing stones a distance equal to the pitch of the two honing stones such that one or the other of the two honing stones is alternately positioned for being pressed against the inner race surface by said lever, whereby said inner race surface is smoothed by the one or the other of the two honing stones by reciprocally moving said holder arm by said first means.

4,534,134

ICE SKATE SHARPENING MACHINE

Joseph A. Consay, and Douglas R. Meier, both of Calgary, Canada, assignors to Universal Skate Sharpeners Ltd., Calgary, Canada

Filed Jul. 7, 1983, Ser. No. 511,622
Claims priority, application Canada, Jun. 10, 1983, 430117
Int. Cl.³ B24B 9/04
U.S. Cl. 51—96 **13 Claims**

1. In a machine for sharpening the bottom edge of the blade of an ice skate, said edge having a convex profile in side view, comprising

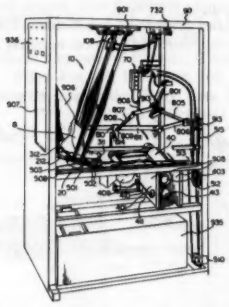
(a) a thin grinding wheel having a periphery with a convex transverse cross-section corresponding to a desired concave transverse cross-section of said blade edge,

(b) means for rotating said wheel about its axis,

(c) means for clamping said blade, and

(d) traversing means for effecting relative movement between the clamping means and the wheel in the longitudinal direction of the blade with the central longitudinal plane of the blade coplanar with the central plane of the wheel and with the wheel biassed against the blade edge to remove a cut therefrom;

the improvement wherein



(e) said traversing means includes position sensitive means for determining the location of the point of contact between the wheel and the blade edge and for regulating said relative movement to take place at a greater speed when said point is in the vicinity of at least one end of said edge than when said point is in the vicinity of a longitudinally central portion of such edge.

4,534,135

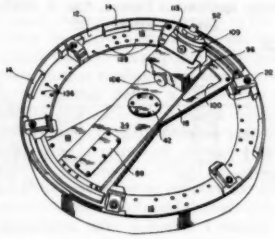
GRINDING MACHINE FOR WATERTIGHT HATCH LUGS

John F. Wilger, Honolulu; Gregory S. Nakano, Pearl City; Stephen Orillo, Jr., Mililani, and John R. Cazinha, Kaneohe, all of Hi., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1984, Ser. No. 578,722

Int. Cl.³ B24B *19/00*

U.S. Cl. 51—241 S **7 Claims**



1. A machine for insitu grinding tapered lugs on a hatch comprising:

a base;

means attached to alternate lugs for mounting the base across the hatch opening;

an elongated plate mounted at its center to the base for pivotal movement thereon;

the pivotal plate having opposite ends, each end of the pivotal plate being extendable between a pair of alternate lugs, one of the lugs between one of said pair of lugs being the lug to be ground;

means mounted on the base for oscillating the pivotal plate back and forth between the lugs of each pair of alternate lugs;

means for grinding;

means mounting the grinding means at one end of the pivotal plate for selectively engaging the grinder with or backing the grinder away from the lug to be ground;

whereby upon oscillating the pivotal plate and engaging the grinding means with the lug to be ground said lug can be ground.

4,534,136

INFORMATION SIGNAL REGENERATING STYLUS AND MANUFACTURING METHOD THEREOF

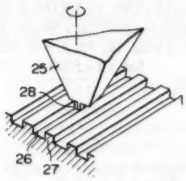
Tetsuo Yoshikane, Katano; Akira Kagata, Neyagawa, and Hiromi Hiura, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 333,897, Dec. 31, 1981, abandoned. This application Jul. 10, 1984, Ser. No. 628,976

Claims priority, application Japan, Dec. 29, 1980, 55-188664; Oct. 27, 1981, 56-172311

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—283 R **4 Claims**



1. A regenerating stylus manufacturing method comprising the steps of: (a) rotating a grinder having a channel of a predetermined width with a flat bottom, (b) providing an electrode having a width larger than that of said channel on a side of a conical stylus base having a tip, said base consisting of nonconductive material, (c) pressing the tip of said conical stylus into said channel, (d) turning the stylus within given angles about a longitudinal axis of the tip of said stylus, and (e) contacting the side wall of said channel with the side of said stylus to reduce the width of said electrode to a width substantially smaller than that of said channel, and to form a projection on the tip of said conical stylus on which projection said electrode having a substantially smaller width than that of said channel is positioned, and to form a sliding face on said tip, said sliding face having a width greater than the width of said electrode formed on the projection of the tip.

4,534,137

METHOD FOR PATTERN GENERATION AND SURFACING OF OPTICAL ELEMENTS

George M. J. Sarofeen, 12501 Brook La., Chester, Va. 23831, and Jeffrey T. Perkins, 1300 Old Long Trail, Richmond, Va. 23235

Continuation-in-part of Ser. No. 404,124, Aug. 2, 1982, abandoned. This application Jan. 3, 1983, Ser. No. 455,201

Int. Cl.³ B24B *1/00*

U.S. Cl. 51—284 R **27 Claims**

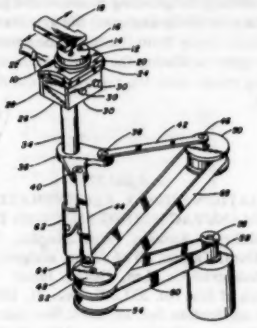
1. A method for surfacing an optical member, comprising the steps of:

(a) securing said optical member;

(b) diposing a surfacing tool in engagement with said optical member; and

(c) while maintaining such engagement between said optical

member and said surfacing tool, displacing said surfacing tool progressively in a first circular pattern, in a first



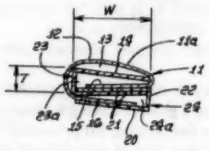
rectilinear pattern along an optical axis of said optical member and in a second circular pattern.

4,534,138

NAIL FILE HAVING FLEXIBLE ABRASIVE SHEET

William E. Pangburn, 2707 Bay Shore, Ventura, Calif. 93003

Filed Dec. 19, 1983, Ser. No. 563,151
Int. Cl.³ B24D *15/00*
U.S. Cl. 51—392 **5 Claims**



1. In a nail file, the combination comprising
(a) an elongated holder having an elongated handle,
(b) a resiliently flexible sheet having an abrasive surface,
(c) and structure on the holder retaining the sheet to the handle so that sheet loosely wraps at least partly about the holder with a gap between the sheet and the holder, whereby the sheet wrap when pressed against a fingernail assumes the contour of the fingernail, the sheet wrap being elongated in the direction of the handle,
(d) the holder comprising two longitudinally elongated plastic strips having channel shaped cross sections which are intermeshed, opposed ends of the sheet penetrating into the channels defined by said strips for retention therein, such that one of said opposed ends of the sheet is retained by one of said channels and the other of said opposed ends is retainer in the other of said channels,
(e) said sheet also wrapping over the outwardly facing surface of one of the channels, the outwardly facing surface of the other channel remaining exposed to the exterior.

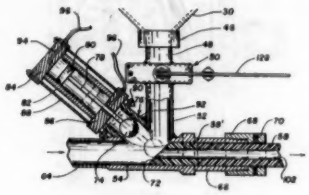
4,534,139

SANDBLASTER

Yvon Desjardins, 897 Lamontagne St., Beellefeuille, Canada (J0R 1A0)

Filed Jan. 23, 1984, Ser. No. 572,869
Int. Cl.³ B24D *11/00*
U.S. Cl. 51—438 **2 Claims**

1. A sandblasting apparatus comprising an upright container for containing abrasive grit under pressure and having a discharge opening at its bottom, a manually-operable grit flow-regulating valve communicating with said discharge opening, an air and sand mixing chamber including a compressed air inlet nipple, a grit inlet nipple, an outlet nipple and a fourth nipple forming a unitary unit and adapted to be mounted under said upright container with said grit inlet nipple disposed upright and communicating with said grit flow-regulating valve, aid air inlet nipple and outlet nipple axially aligned and making a substantially right angle with said grit inlet nipple, said fourth nipple making an acute angle with said air inlet nipple, all of said nipples intersecting and defining a cavity at their intersection, said air inlet nipple provided with means for connection to a supply of air under pressure, a sandblasting hose, of elastomeric material, having one end portion inserted into and de-



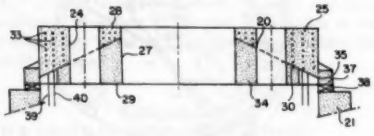
tachably secured to said outlet nipple and carrying a nozzle at its other end portion, said hose having a bore, the inner end of said hose exposed within said cavity, a double-acting pressurized air-operated cylinder and piston unit removably mounted on, and carried by, the outer end of said fourth nipple, a piston rod fixed to the piston of said unit and axially extending through said fourth nipple, a ball fixed to the outer end of said piston rod and of larger diameter than that of said bore, said ball movable by said cylinder and piston unit between a retracted position confined within said fourth nipple and shielded from grit flowing through said grit inlet nipple, and an advanced position abutting said hose inner end and sealing said bore, and remote control means operable at said nozzle for operating said cylinder and piston unit.

4,534,140

ANNULAR SLAB FOR CLOSING THE VESSEL OF A FAST NEUTRON NUCLEAR REACTOR

Claude Malaval, Antony, France, assignor to Novatome, Le Plessis Robinson, France

Filed Mar. 7, 1983, Ser. No. 472,814
Claims priority, application France, Apr. 8, 1982, 82 06125
Int. Cl.³ E04H *7/20*
U.S. Cl. 52—21 **6 Claims**



1. In a nuclear reactor comprising a concrete structure including a cylindrical vessel well (21) with a vertical axis having an upper part on which a slab (20) having a periphery rests horizontally, said slab consisting of a composite structure of steel and concrete, and a vessel (40) suspended from a lower part of said slab, said slab closing said vessel and comprising an annular envelope consisting of two coaxial cylindrical sleeves (25, 27) and two annular face plates (28, 29) joined together directly and by means of a stiffening assembly, said envelope being filled with concrete except for cylindrical spaces (24) with axes parallel to the axis of said sleeves (25, 27) and passing right through said slab (20) for the passage of reactor components immersed in said vessel (40), which slab comprises, inside

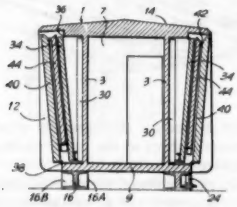
said envelope, as the stiffening element, the improvement consisting of at least one frusto-conical sleeve (30) coaxial with said sleeves (25, 27) limiting said slab (20), welded to said envelope along its small base in the region of said upper part of said envelope, and along its large base in the region of said lower part of said envelope, having openings for the passage of said components and dividing the interior volume of said envelope into two superposed parts.

4,534,141

TRANSPORTABLE PRE-FABRICATED BUILDING STRUCTURE

Giovanna Maria Fagnoni, V. Pian dei Giullari 86, Firenze, Italy

Filed Jun. 13, 1983, Ser. No. 503,501
Claims priority, application Italy, Jun. 18, 1982, 9442 A/82
Int. Cl.³ E04B *1/343*
U.S. Cl. 52—68 **17 Claims**



1. In a building structure a framework including:
elongate members,
support and runner base beams,
a flooring member,
a roofing member, and
end wall members, all of these members and beams being rigidly interconnected to define a useful space,
further flooring panel members pivoted to the framework at axes extending parallel to the beams and elongate members,
further roofing panel members pivoted to the framework at axes extending parallel to the beams and elongate members,
further wall members one being pivoted to each further flooring panel member and pivotal, when the corresponding further flooring member is in situ, to a vertical orientation, and
further, panel, wall members pivoted to the end wall members about respective vertical axes and movable into configurations wherein corresponding further flooring panel members, further roofing panel members and further wall members together define a further useful space when pivoted to orientations extending outwardly from the framework, and pivotally mounted support legs which are movable from a retracted, storage configuration to an extended configuration when the structure is in situ wherein the legs serve to support the members defining said further useful space, said support and runner beams of the framework have a double T-section defining lateral recesses adapted to accommodate the support legs.

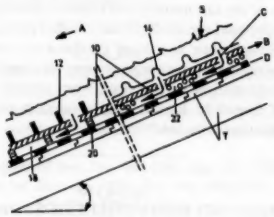
4,534,142

ROOF COVERING

Jens Drefahl, Amselweg 18a, 6458 Rodenbach 2, Fed. Rep. of Germany

Filed Jun. 23, 1981, Ser. No. 276,512
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024672
Int. Cl.³ E04B *7/02*
U.S. Cl. 52—90 **13 Claims**

1. Roof covering for greening an inclined cold or warm roof having a supporting construction resting on walls and a water-impermeable roof skin, said roof covering comprising: a plant carrying layer applied on top of the roof; a non-rotting holding structure which is independent of the subjacent roof structure and of the roof skin, said holding structure being placed on the inclined roof loosely and largely free of tension and friction of the roof and being secured only at a roof beam against sliding; holding projections distributed over an upper surface of said



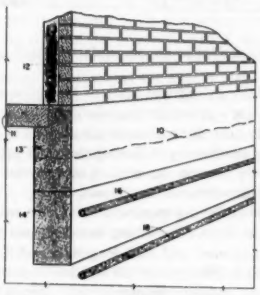
holding structure and frictionally and thrust-absorbingly engaging in the plant-carrying layer to be applied to the upper side; said holding structure conducting thrust and connecting said plant-carrying layer with the roof beam; a filter layer beneath said holding projections; a drainage underneath said filter layer; said drainage being part of said holding structure; said drainage having distributed spacers in contact with said filter layer.

4,534,143

SYSTEM FOR CONTROLLING THE MOISTURE IN THE SUBSURFACE SOIL SURROUNDING A BUILDING

Fredrick J. Goines, Tulsa, and David A. Reifsteck, Muskogee, both of Okla., assignors to Midwest Irrigation and Foundation, Inc., Tulsa, Okla.

Filed Oct. 24, 1983, Ser. No. 544,717
Int. Cl.³ E02D *27/00*
U.S. Cl. 52—169.5 **5 Claims**



1. Apparatus for controling the moisture in the ground surrounding a building which comprises a first circumferential conduit extending around the building approximately ten inches below the ground level and from six to twenty-four inches away from the foundation of the building, the major portion of said first circumferential conduit being composed of porous flexible hose capable of permitting seepage of water from the inside of the hose to the outside thereof through the pores of the hose when water under pressure is fed into the interior of the hose, a supply conduit having an inlet end and an outlet end, the inlet end of the supply conduit being connected to a water main, an on-off valve having an inlet and an outlet, the inlet to the on-off valve being connected to the outlet of the supply conduit, a pair of check valves connected in series to

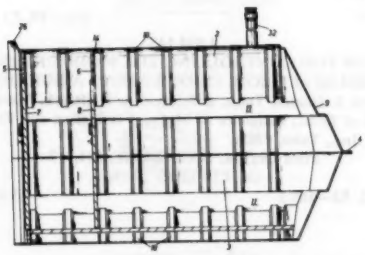
the outlet of the on-off valve, a pressure regulating valve connected to the downstream side of the series-connected check valves for reducing the pressure from the water main to about 1 to 5 psi, a terminal conduit connected to the pressure regulator valve for conducting water under 1 to 5 psi to the circumferential conduit, the terminal conduit connecting to the circumferential conduit through a tee connection, a metering valve located in the circumferential conduit on each side of the tee and adjacent the tee for controlling the flow of water into each side of the circumferential conduit leading away from the tee whereby said circumferential conduit presents a controlled water seepage zone at a level of about ten inches below the ground, a second water seepage zone disposed below said first zone and formed in part at least from porous flexible hose of the type described herein, said second zone being in fluid communication with said first zone.

4,534,144

UNDERGROUND BOMB SHELTER/STORAGE CELLER UNIT

Bert Gustafsson, Rönnvägen 8, S-370 34 Holmsjö, and Hans-Erik Sträng, Lövängsvägen 9, S-370 20 Lyckeby, both of Sweden

Filed Nov. 12, 1982, Ser. No. 441,076
Int. Cl.³ E02D *27/00*
U.S. Cl. 52—169.6 **4 Claims**



1. A bomb shelter to accommodate a small group of people, comprising

an essentially cylindrical body of fiberglass-reinforced plastics having a generally smooth outer surface, said cylindrical body consisting of separate upper and lower sections,

peripheral reinforcing stiffening members extending circumferentially around the wall of said shelter body and projecting into the interior thereof,

lengthwise stiffening members formed in said bomb shelter body, the cross-over points between said peripheral stiffening members and said lengthwise stiffening members arranged to ensure that the smaller ones of said stiffening members extend uninterrupted through indentations formed in the larger ones of said stiffening members, whereby both said smaller and said larger stiffening members will be continuous,

sealed joints interconnecting said sections to form said cylindrical body,

an external end wall at the forward end of said bomb shelter and supportingly engaged with the outerforward surface of one of said stiffening members and an inner end wall spaced a predetermined distance from said external end wall and supportingly engaged with the outer forward surface of another of said reinforcing members whereby said stiffening members support said walls against external blasts, and

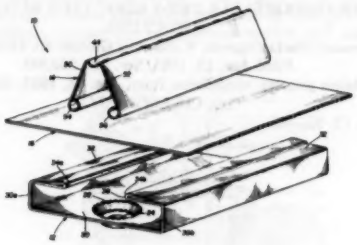
one door in each of said end walls, said doors arranged to be opened outwards.

4,534,145

ATTACHMENT DEVICE FOR SECURING FLEXIBLE SHEETS

James H. C. Yang, Cleveland; Walter Tomaszewski, Canton, and Heinz W. Benezé , Akron, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 25, 1983, Ser. No. 516,618
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—222 **22 Claims**



1. An attachment device for mechanically securing at least one flexible elastomeric sheet to the upper surface of a roof, said attachment device comprising:

(a) a substantially rigid channel member having a generally rectangular cross-section and a continuous, central longitudinal slot opening into said channel member, a bottom wall, an upper wall, and generally opposed sidewalls, said channel member having a width which is defined by said opposed sidewalls; and

(b) an insert member comprising means for maintaining said at least one flexible elastomeric sheet within said channel member, said insert member being formed from a ductile and rigid material and having an integral central longitudinal portion of reduced rigidity and two adjacent wing portions located on opposed edges of said central longitudinal portions, said central longitudinal portion defining said two adjacent wing portions and comprising means for facilitating the plastic deformation of said insert member from a first position to a second position, said insert member having a generally inverted V-configuration in said first position with said central longitudinal portion being located at the apex of said inverted V, and occupying said second position after undergoing a plastic deformation during insertion of said insert member together with said at least one flexible sheet into said channel member, said insert member being either substantially flat or slightly concave in said second position and comprising means for frictionally and non-bindingly maintaining said at least one elastomeric sheet against one wall of said channel member, thereby permitting lateral and vertical shifting of said insert member, and said at least one flexible sheet within said channel member, said insert member having a width when in said second position which is less than said channel member width.

4,534,146

PARTITION STRUCTURE

William Preston, 7668 Lemon Ave., Lemon Grove, Calif. 92075

Filed Jun. 13, 1983, Ser. No. 503,605
Int. Cl.³ E04H *1/00*
U.S. Cl. 52—239 **11 Claims**

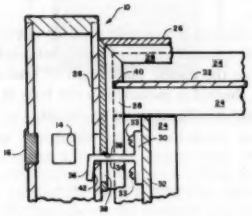
1. An improved partition structure comprising:

at least two panel members having vertical and horizontal end surfaces;

vertical and horizontal framing members for enclosing the vertical and horizontal end surfaces of said panel members, said framing members being I shaped in cross-section forming inner and outer channels on each side of a central

portion and said vertical framing members having opposite ends and having at least one outwardly extending lock member intermediate its ends, said lock member having a body perpendicular to its attached frame member and a downwardly extending distal end surface;

facing members having an outer facing surface and inwardly extending vertical edges for insertion into and covering said outer channel of said vertical framing members, the vertically positioned facing members have a locking slot in each inwardly extending vertical edge which mate with the central portion of the adjacent horizontal framing member, said outer facing surface having at least one opening having an upper surface for receiving one of said



locking members, said upper surface of said opening and the locking member being closely adjacent whereby the slot engagement and close adjacency between said opening and locking member substantially prevent relative vertical movement between the facing members and vertical framing members; and

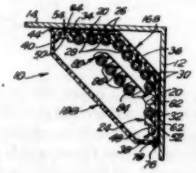
at least three vertical tubular post members for supporting the framed panels in a vertical position, said post members each having at least one locking member engaging opening whereby at least one locking member when inserted into a vertical post opening and moved downwardly relative to said vertical post member removably secure said post member to said panel.

4,534,147

DUCT MOLDING AND CABLE MOUNTING CLIPS

Frank A. Cristell, Lakewood, N.J., assignor to Robert H. Donahue, Westfield, N.J.

Filed Dec. 9, 1982, Ser. No. 448,246
Int. Cl.³ H02G *3/04*; E04F *19/04*
U.S. Cl. 52—287 **15 Claims**



1. A duct assembly for retaining a plurality of cables, said assembly comprising:

a unitary elongated base including two angularly related panels for respectively fixedly mounting against two angularly related planar surfaces;

an elongated movable cover connected to and extending between said two angularly panels so as to define an elongated tubular enclosure therebetween when said movable cover is connected to said two angularly related panels;

at least one cable retaining clip having a pair of ends, said ends being disposed within said enclosure and removably mounted to said base, said at least one clip including a plurality of pairs of bendable resilient cable retaining means, each of said pair of bendable resilient retaining means including a pair of spring fingers, each of said pair of spring fingers having bias means returning said pair of spring fingers to an initial position following said mounting of the cables therebetween, said each pair of spring fingers defining a recess thereinbetween; and

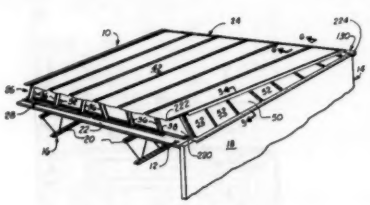
at least one expansion module having a plurality of recesses for removably retaining cables, said expansion module including a mounting hub removably mounted in said recess of said cable retaining clip.

4,534,148

ADJUSTABLE ROOFING SUPPORT SPACER APPARATUS AND ERECTION METHOD

Harold G. Simpson, Oklahoma City, and Leo E. Neyer, Edmond, both of Okla., assignors to Encon Products, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 487,614, Apr. 22, 1983,. This application Jun. 10, 1983, Ser. No. 503,299
Int. Cl.³ E04B *1/32*
U.S. Cl. 52—640 **6 Claims**



1. An adjustable roofing support spacer apparatus positionable on a preexisting roof to partially support at least one roof panel member, comprising:

a first beam;

a second beam supported by the preexisting roof;

connector means for connecting the second beam to the preexisting roof; and

adjustable web means for interconnecting the first and second beams and for supporting the first beams so that it is disposed above the second beam in a selected plane independent of the slope of the preexisting roof, the adjustable web means comprising a plurality of spacer webs and attaching means for attaching the spacer webs to the first and second beams and determining the relative disposition of the first and second beams at the site of the preexisting roof so that the first beam is supported at selected heights along the length thereof above the preexisting roof.

4. A method for reroofing a preexisting roof of a structure with a new roof slope independent of the slope of the preexisting roof structure, the structure having a plurality of walls, each wall having an upper end portion, the method comprising the steps of:

securing an eave connector assembly to the upper end portion of one of the walls of the structure;

securing an adjustable roofing support spacer to the preexisting roof such that the adjustable roofing support spacer is disposed at a location on the preexisting roof substantially corresponding to the ridge of the new roof structure and substantially parallel to the eave connector assembly, the adjustable roofing support spacer further characterized as having a first beam, a second beam and an adjustable web assembly disposed between and interconnecting the first beam and the second beam;

connecting the second beam to the preexisting roof;

adjusting the adjustable web assembly of the adjustable roofing support spacer so that the first beam thereof is substantially horizontally disposed a selected distance above the second beam and independent of the slope of the plane of the preexisting roof;

positioning at least one panel member across the first beam

of the adjustable roofing support spacer and the eave connector assembly such that the panel member is supported thereby; and

connecting the panel member to the first beam of the adjustable roofing support spacer and the eave connector assembly to provide the new roof structure having a roof plane substantially independent of the roof plane of the preexisting roof.

4,534,149

MACHINE FOR CLOSING FILLED BAGS

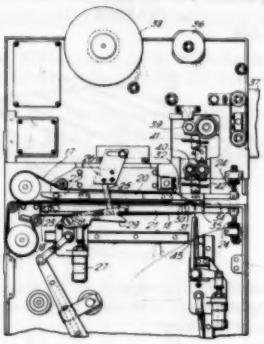
Trevor B. Hoyland, Norfolk, England, assignor to Thurne Engineering Co. Ltd., Norwich, England

Filed May 29, 1984, Ser. No. 614,938

Claims priority, application United Kingdom, May 27, 1983, 8314764

Int. Cl.³ B65B *7/08*

U.S. Cl. 53—76 **14 Claims**



1. A bag tying machine comprising a guide, said guide receiving an open end part of a filled bag as it is moved through the machine to be tied, a follow-up member, said follow-up member being movable adjacent said guide following said open end part of a bag to gather it together, tape supply means for supplying a length of pressure sensitive adhesive tape and holding it across a path of said gathered together end of the bag, and a pair of pivoted arms, located on opposite sides of said path of said gathered together end of said bags through said machine whereby said gathered together neck of said bag passes between said pair of arms, said pair of pivoted arms including a first and a second pair of jaws, said first pair of jaws being located upstream from said length of pressure sensitive adhesive tape and said gathered together end of said bag being initially compressed against them, said second pair of jaws being located immediately downstream from said adhesive tape, and supporting said adhesive tape as said gathered together neck of said bag is urged into contact with said adhesive tape, said second pair of jaws clamping said adhesive tape around said gathered together neck of said bag to tie it together as said follow-up member urges said gathered together neck between them.

4,534,150

TOOL FOR USE WITH REFILLING EMPTY AMPULES WITH DENTAL IMPRESSION MATERIALS

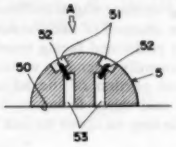
Kazunori Shirota, Tokyo, Japan, assignor to Shirota Denki Rozai Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1983, Ser. No. 456,374

Int. Cl.³ B65B *67/00*

U.S. Cl. 53—390 **4 Claims**

1. A tool for use in refilling dental impression materials into a tubular ampule which has a lower end thereof hermetically sealed by a diaphragm made from elastic materials, said tool comprising a heavy base block having a flat bottom, an upper surface of the block being provided with at least one hole, the diameter and depth of which are such that said hole can stably support therein said lower end of a tubular ampule, and a



hollow needle located in said hole with its upper end projecting into the hole coaxially thereof and positioned to have said upper end pierce the elastic diaphragm of said ampule when said lower end thereof is mounted in the hole in said block, a lower end of said needle opening to the air.

4,534,151

METHOD AND APPARATUS FOR PACKAGING PAPER ROLLS

Hans Schneck, and Esko Tiitinen, both of Varkaus, Finland, assignors to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

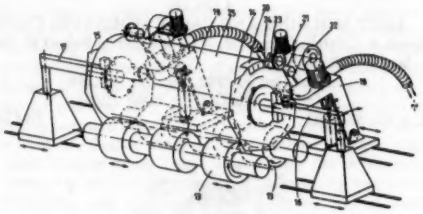
PCT No. PCT/FI82/00048, § 371 Date Jul. 13, 1983, § 102(e) Date Jul. 13, 1983, PCT Pub. No. WO83/01765, PCT Pub. Date May 26, 1983

PCT Filed Oct. 25, 1982, Ser. No. 514,802

Claims priority, application Finland, Nov. 16, 1981, 813607

Int. Cl.³ B65B *11/04, 51/06, 61/00*

U.S. Cl. 53—415 **6 Claims**



1. A method for packaging a paper roll or the like in which a wrapping material is wrapped around the roll and headers are secured to the ends of the roll, which consists of the steps of

(a) wrapping a wrapper sheet (1) of width greater than the axial length of the roll (2) around the roll,

(b) securing the wrapper sheet to the roll,

(c) removing the portions (5,6) of the wrapper sheet which extend over the ends of the roll, whereby the width of the wrapper sheet is reduced to the size of the length of the roll,

(d) placing header sheets (14,15) of size greater than the end surface of the roll against the ends of the roll,

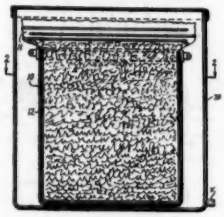
(e) removing at least the edge portion of the header sheets extendng over the end surface and reducing the header sheets to obtain headers of the size of the roll diameter or smaller, while the roll is rotated,

(f) securing the headers to the wrapper so that a tight joint is formed.

4,534,152
SELF SEALING VACUUMED PACKAGE

Walter I. Akkala, 381 Sycamore Sq., Lady Lake, Fla. 32659

Filed Mar. 29, 1983, Ser. No. 479,895
Int. Cl.³ B65B *31/00*
U.S. Cl. 53—434 2 Claims

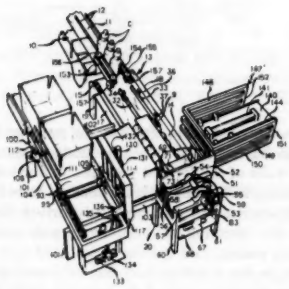


1. A method for vacuum packaging heat sensitive powdered products and perishable cheese products and knitting the cheese curds using a vacuum, comprising; placing a cheese product in a thermoplastic bag impervious to the ingress of atmospheric air and forming a tortuous vent passage in the open end of the bag above the product; placing the filled bag in a supportive container having a two section cover through which the tortuous vent portion protrudes to prevent the bag from expanding and bursting when subjected to a vacuum; placing the supportive container in a vacuum chamber and subjecting it to a vacuum to remove air within the bag through the formed tortuous vent passage; opening the vacuum chamber collapsing the tortuous vent passage and creating a temporary seal and collapsing the bag around the product causing it to compact the product, removing the vacuumized filled bags from the supportive container and vacuum chamber; and permanently sealing the tortuous vent passage diagonally transversing at least one or more of the passage sections of the tortuous vent passage.

4,534,153
METHOD AND APPARATUS FOR PACKING PLASTIC BOTTLES

Casimir W. Nowicki, Sylvania, Ohio, Owens Illinois Inc. Toledo, Ohio

Filed Jul. 11, 1983, Ser. No. 512,309
Int. Cl.³ B65B *5/06, 35/44*
U.S. Cl. 53—448 18 Claims

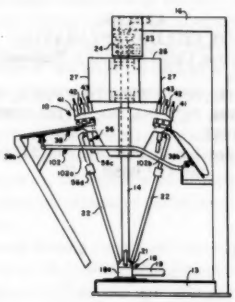


18. The method of packing a plurality of containers in a carton wherein the containers are moved in single file into the case packer entrance, comprising moving the single file containers in an upright attitude and in a predetermined order into a plurality of adjacent lanes of a receiver, filling the lanes with containers, gripping each of the containers in the receiver, rotating said receiver and the gripped containers through an angle of 90° about a horizontal axis which is parallel to the lanes of the receiver, supporting an open carton on a stand adjacent said receiver, grasping said empty carton and pivoting said grasped carton through 90° to place the open end of the carton in facing relationship with respect to said rotated containers, moving the containers, as a unit, directly from the receiver into the carton and returning the filled carton to its upright position, whereby the full complement of containers in the receiver are transferred to the interior of the carton.

4,534,154
METHOD AND MACHINE FOR FILLING BAGS WITH LIQUID

Rene J. Gaubert, 4219 Oakmore Rd., Oakland, Calif. 94602

Filed May 10, 1983, Ser. No. 493,429
Int. Cl.³ B65B *3/04*
U.S. Cl. 53—458 19 Claims



1. A method for filling pouches or bags with liquid, the bags being made of flexible film material with one unsealed end portion, one side wall of the bag adjacent said unsealed end portion having a filling opening, comprising the steps of positioning a bag on supporting means with the filling opening facing downwardly, separating the side walls of said unsealed end portion, inserting a presser member having an opening, into the open end of the bag, forming registration between the filling opening the opening in the pressure member and means for introducing liquid into the bag, causing the presser member to press the peripheral area of said one wall in an area surrounding the filling opening to form a seal between said one wall and liquid introducing means closing the unsealed end portion about the pressure member, introducing a measured amount of liquid through the filling opening and into the bag to fill the same, and then sealing the filling opening and the unsealed end portion.

4,534,155
SOLID MATERIAL PACKING METHOD AND MACHINE

Yuji Sawa; Toshio Itoh, and Kuniomi Adachi, all of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

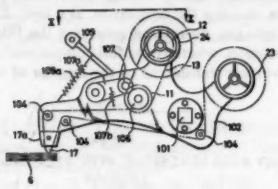
Filed Apr. 27, 1982, Ser. No. 372,351
Claims priority, application Japan, Apr. 28, 1981, 56-63371; May 20, 1981, 56-71908[U]; May 26, 1981, 56-75190[U]
Int. Cl.³ B65B *43/30, 43/16*
U.S. Cl. 53—459 25 Claims

1. A packing method of the type comprising the steps of transporting one of a plurality of bags from a storage location to a packing location and inserting a material into said bag, the improvement characterized in that said transporting step comprises:

pressing against said one bag with a member having at least one exposed adhesive surface thereon;

pivotably moving said member from a first position in which it presses against said one bag at said storage location to a

second position in which it holds and supports said one bag; and laterally translating said member in a horizontal plane to a third position arranged at the end of a packing



slide, whereat said one bag is opened to receive said material, said one bag remaining adhered to said member until said material is inserted into said bag.

4,534,156

BOX FILLING APPARATUS

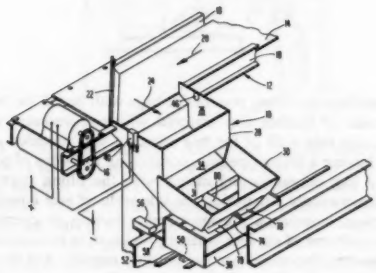
Gary T. Smith, Exeter, Calif., assignor to Pennwalt Corporation, Philadelphia, Pa.

PCT No. PCT/US82/00773, § 371 Date Feb. 6, 1984, § 102(e) Date Feb. 6, 1984, PCT Pub. No. WO83/04401, PCT Pub. Date Dec. 22, 1983

PCT Filed Jun. 7, 1982, Ser. No. 577,009

Int. Cl.³ B65B *5/10*

U.S. Cl. 53—503 **12 Claims**



1. In apparatus for filling a box with articles from a movable conveyor, first means for driving said conveyor, a bin positioned adjacent said conveyor and having an opening for receiving said articles, diverter means for directing said articles from said conveyor through said opening into said bin, said bin having an outlet for said articles, a chute operatively associated with said bin and movable between a first position closing said outlet and a second position opening said outlet and delivering said articles to said box, second means for moving said chute between said first and second positions, and third means operatively associated with said first and second means and responsive to the filling of said bin with articles for controlling said first and second means to regulate the feeding of said articles to said bin and the discharge of articles from said bin.

4,534,157

CASE LIFT OUTFEED APPARATUS

Robert W. McGill, Munroe Falls, and Chris E. Robinson, Akron, both of Ohio, assignors to Figgie International Inc., Willoughby, Ohio

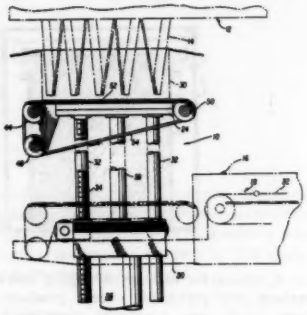
Filed Jun. 29, 1982, Ser. No. 393,463

Int. Cl.³ B65B *43/52, 5/06, 21/16*

U.S. Cl. 53—531 **11 Claims**

1. In a case lift apparatus including, a frame, a receiving platform and a powered lift cylinder operatively connected to said platform to raise and lower the same, the improvement comprising:

a pair of endless extensible belts operatively journalled on said platform in spaced parallel relation, said belts having a horizontal course position slightly above the upper



surface of said platform for support of cases on said platform, said belts also having a lower course positioned below and spaced from said platform; and

a driving roll means journalled on said frame below said platform and adapted to engage and drive said belts when said platform is at or approaching its lower position.

4,534,158

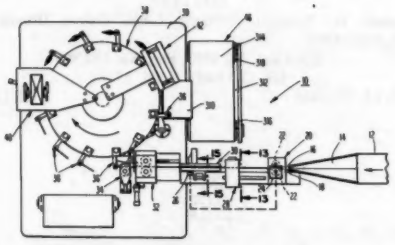
PACKAGING MACHINE

Robert B. McClosky, Hasbrook Heights, N.J., assignor to Wrapade Machine Company, Inc., Clifton, N.J.

Filed May 31, 1983, Ser. No. 499,793

Int. Cl.³ B65B *43/30*

U.S. Cl. 53—562 **20 Claims**



1. A packaging machine for forming pouches from a continuous web having confronting sections adapted to provide opposed walls of the formed pouches, said machine including cutting means for cutting discrete pouches from the continuous web; characterized in that positively driven feed means are provided for directing the continuous web material through the cutting means, said cutting means and feed means being adjustable in the machine-direction of travel of the web for setting the desired width of the pouches to be formed, drive means associated with the feed means and including elements movable with said feed means for automatically varying the speed of the feed means when the feed means is moved to thereby feed the desired length of continuous web through the cutting means between operating strokes of said cutting means to thereby control the width of the pouches severed from said web.

4,534,159

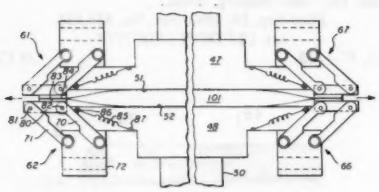
APPARATUS FOR FORMING, FILLING AND SEALING BAGS WITH FLUID CONTENTS

Robert C. Kelly, Houston, Tex., assignor to General Packaging Equipment Company, Houston, Tex.

Filed Nov. 12, 1982, Ser. No. 441,088

Int. Cl.³ B65B 9/08

U.S. Cl. 53—552 **8 Claims**



1. Improved apparatus for forming, filling and sealing bags from a continuous supply of bagging material including a pair of sealing jaws transversely movable toward each other to engage said bagging material to form a transverse seal providing the top closure for a filled bag and a bottom closure for a succeeding bag, said improvement comprising stretch means attached to said sealing jaws, at opposite ends thereof, and engageable with opposign edges of said bagging material to provide opposing forces in directions perpendicular to the movement of said sealing jaws to flatten said bag and remove any wrinkles therefrom prior to said sealing by said sealing jaws, said stretch means comprising first and second pairs of stretch assemblies at each end of said pair of sealing jaws having engagement means thereon engageable with said bagging material, as said pair of sealing jaws move toward each other, so that a first edge of said bagging material is gripped between the engagement means of said first pair of stretch assemblies and a second and opposite edge of said bagging material is gripped between the engagement means of said second pair of stretch assemblies, said engagement means of said first and second pairs of stretch assemblies being forced outwardly in opposite directions perpendicular to said movement of said jaws to provide said opposing forces to said bagging material, each of said stretch assemblies comprising a pair of parallel finger members the first ends of which are pivotally attached to mounting means stationarily fixed relative to one of said pair of sealing jaws and the second ends of which are pivotally attached to said engagement means so as to allow each of said engagement means to move outwardly upon said gripping of said bagging materials between the engagement means of respective pairs of stretch assemblies.

4,534,160

METHOD AND APPARATUS FOR SPLICING YARNS

Rainer Lorenz, Nettetal-Breyll, Fed. Rep. of Germany, assignor to Palitex Project-Company GmbH, Krefeld, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,742

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243410

Int. Cl.³ B65H 69/06; D01H 15/00; D02G 3/22

U.S. Cl. 57—22 **16 Claims**

1. A method of making a splice between ends of multi-ply yarns, comprising the steps of

(a) holding the mutually separated ply ends at the ends of the multi-ply yarns;

(b) shortening at least one ply end by a predetermined length at the end of each multi-ply yarn within a predetermined length of an end portion of the multi-ply yarn which has been freed from the multi-ply yarn twist, such that different lengths of shortening are associated with all the ply ends of the end of each multi-ply yarn;

(c) introducing a twist of predetermined degree and direction into each of the mutually separated ply ends, the direction of twist corresponding to the direction of twist of the original twist of the multi-ply yarn;

(d) bringing the two twisted ends of the multi-ply yarn together parallel to the longitudinal direction of the multi-ply yarn until each ply end of the end portion of one multi-ply yarn overlaps at least one ply end of the end portion of the other multi-ply yarn, the lengths of shortening of the ply ends being chosen such that the regions of overlap of the mutually associated ply ends are disposed in the longitudinal direction of the ply yarn without these regions of overlap themselves overlapping one another;

(e) at least temporarily holding a respective ply end of the end portion of one multi-ply yarn on an associated ply end of the end portion of the other multi-ply yarn in the region of overlap;

(f) commonly twisting the mutually associated ply ends with a predetermined degree of twist for the purpose of holding them together, the direction of each twist being opposite to the direction of twist of the original twist of the multi-ply yarn;

(g) commonly freeing the ply ends held against one another with respect to twisting, and introducing a twist in the same direction into the end portions of the multi-ply yarns;

(h) subsequently introducing the multi-ply yarn twist in the original direction of the multi-ply yarn twist; whereby

(i) the mutually associated ply ends are held against one another by these ply ends being twisted about one another and by such twist being maintained at least up to the termination of method step (h).

14. Apparatus for making a splice between ends of multi-ply yarns comprising two units which are relatively movable towards one another for receiving a respective one of the ends of two multi-ply yarns over a predetermined portion of the lengths thereof, each of the two units comprising:

(a) one or more first rotatable clamping devices for commonly or separately holding the outermost ply ends of the end of the multi-ply yarn and for introducing a multi-ply yarn twist or a ply twist;

(b) a second clamping device for holding the multi-ply yarn at a predetermined distance from the outermost end thereof;

(c) a third clamping device for holding the multi-ply yarn at a predetermined point between the first and the second clamping devices;

(d) fourth rotatable clamping devices disposed between the respective first clamping device and the third clamping device, the fourth clamping devices for the end of one multi-ply yarn being combinable with the first clamping devices disposed at the associated ply end of the end of the other multi-ply yarn;

(e) cutting means into which the ply ends can be introduced and which has a cutting tool for each ply end; and

(f) means for bringing together mutually associated ply ends of the ends of the two multi-ply yarns in overlapping fashion.

4,534,161

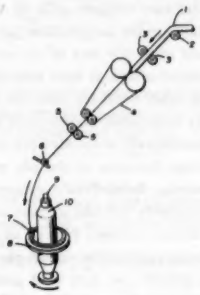
RING SPINNING PROCESSES FOR CONVERTING SLIVER TO CARPET YARN

Don E. Fisher, Pensacola, and Arnold E. Wilkie, Pensacola Beach, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 460,213, Jan. 24, 1983, abandoned. This application Aug. 31, 1984, Ser. No. 645,988

Int. Cl.³ D01H *7/60*

U.S. Cl. 57—125 **6 Claims**



1. In a process for continuously converting sliver to carpet yarn on a spinning frame wherein the sliver is drafted and twisted to form a yarn that is delivered by means of delivery rolls to a traveler around which the yarn makes a partial wrap before being wound onto a bobbin mounted on a spindle rotating at its maximum practical mechanical speed, the improvement comprising in combination (1) using a traveler having a weight ranging from 3.0 to 18.0 grains (0.2 to 1.2 grams) and a yarn contact section characterized in that the yarn contact edge thereof has a radius of curvature of less than 20 mils (0.5 mm), and (2) operating said delivery rolls at a delivery speed which is higher than possible when using a traveler having a yarn contact edge with a radius of curvature greater than 20 mils (0.5 mm).

4,534,162

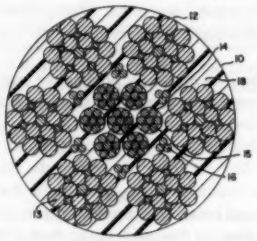
PLASTIC ENCAPSULATED WIRE ROPE

Peter P. Riggs, Isle of Man, Isle of Man; Harry L. Data, and Robert B. Hoganson, Jr., both of Kenosha, Wis., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Aug. 8, 1983, Ser. No. 521,068

Int. Cl.³ D07B *1/16, 7/12*

U.S. Cl. 57—217 **20 Claims**



1. A wire rope comprising:

a central core including a plurality of wire strands,

a plurality of outer strands surrounding said core,

a plurality of spacer strands located in the interstices between said core and said outer strands, said spacer strands leaving passageways to permit flow of a coating material therethrough,

and a coating extending from substantially the outer diameter of the outer strands down to and into the central core.

4,534,163

ROPE OR CABLE AND METHOD OF MAKING SAME

Peter E. Schuerch, Windham, N.H., assignor to New England Ropes, Inc., New Bedford, Mass.

Filed Sep. 19, 1983, Ser. No. 533,154

Int. Cl.³ D07B *1/04, 7/14*

U.S. Cl. 57—233 **28 Claims**

1. A method of making rope or cable comprising the steps of:

(a) aligning a multiplicity of filaments in substantially parallel relation to each other and to the rope axis;

(b) compacting said filaments under tension to form a core; and

(c) spirally wrapping said core with one or more tapes so as to completely cover said core while at the same time maintaining said core filaments substantially parallel to the rope axis.

17. A rope or cable comprising:

(a) a core having a multiplicity of compacted tensioned filaments aligned in substantially parallel relation to each other and to the rope axis, said filaments being independent of each other; and

(b) a jacket around said core comprising one or more tapes helically wound around said core so as to completely cover same.

4,534,164

TEXTURED YARN AND METHOD AND APPARATUS FOR PRODUCING THE SAME

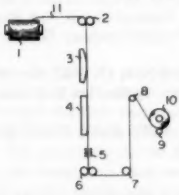
Kuroda Toshimasa, Takatsuki; Kimura Akio, Ashiya; Horiuchi Takumi; Sasaki Koki, both of Matsuyama, and Ikuta Terukuni, Takatsuki, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 10, 1983, Ser. No. 473,950

Claims priority, application Japan, Mar. 16, 1982, 57-40304; Mar. 17, 1982, 57-40705; Mar. 18, 1982, 57-41737

Int. Cl.³ D02G *1/02;* D01H *13/28*

U.S. Cl. 57—290 **12 Claims**



1. A method for producing a textured yarn suitable for weaving a fabric having an improved width shrinkage, in which a partially oriented yarn of polyester filament is textured by false-twisting simultaneously with drawing by a draw-texturing machine which comprises a main heater, an additional heater and a false twister arranged in series between a feed roller and a delivery roller, said additional heater being maintained at a temperature lower than the temperature of the main heater and said false-twister being of a friction type having a

yarn driving function, said method being characterized in that, said yarn is delivered through a yarn path from said main heater to said false twister through said additional heater, so that said yarn has a yarn temperature above 80° C. at the moment of introduction into said false twister.

4,534,165

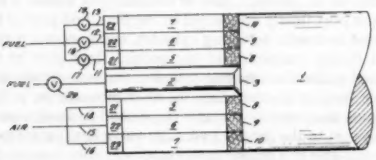
CATALYTIC COMBUSTION SYSTEM

L. Berkley Davis, Jr., Schenectady; Milton B. Hilt, Sloansville, and Colin Wilkes, Scotia, all of N.Y., assignors to General Electric Co., Schenectady, N.Y.

Continuation of Ser. No. 479,918, Mar. 28, 1983, abandoned, which is a continuation of Ser. No. 181,966, Aug. 28, 1980, abandoned. This application Oct. 7, 1983, Ser. No. 540,036

Int. Cl.³ F02C *3/16*

U.S. Cl. 60—39.02 **3 Claims**



1. A method for operating a combustor of a gas turbine, said combustor being of the type having a catalytic combustion zone including a plurality of independent catalytically supported combustion sections, a single pilot zone downstream of said catalytic combustion zone, means for feeding a fuel to said single pilot zone, means for independently introducing fuel and air into said plurality of independent catalytically supported combustion sections and all of an effluent of said plurality of independent catalytically supported combustion sections entering said single pilot zone, comprising:

initially accelerating said gas turbine to a predetermined load condition using hot gases generated only in said single pilot zone by feeding said fuel to said single pilot zone and air into at least one of said plurality of independent catalytically supported combustion sections, said air passing downstream of said at least one of said plurality of independent catalytically supported combustion sections to be useable as combustion air with said fuel in said single pilot zone; and

further accelerating said gas turbine to a greater load condition by staging fuel to individual ones of said plurality of independent catalytically supported combustion sections to produce additional hot gases which pass downstream of said plurality of catalytically supported combustion sections, an excess air in said additional hot gases being effective to support combustion of said fuel fed to said single pilot zone and combustion in said single pilot zone being effective to clean up unburned portions of fuel entering said single pilot zone with said hot gases from said plurality of catalytically supported combustion sections; and

at least partially preheating a catalyst in said catalytically supported combustion sections toward an operating temperature during the step of initially accelerating said gas turbine.

4,534,166

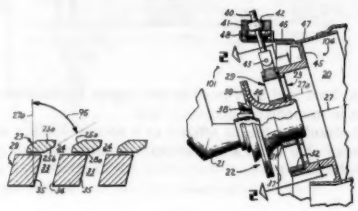
FLOW MODIFYING DEVICE

James S. Kelm, Milford; Edward C. Vickers, Cincinnati; Jesse J. Williams, Cincinnati, and Jack R. Taylor, Cincinnati, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 192,677, Oct. 1, 1980, abandoned. This application Jun. 3, 1983, Ser. No. 500,651

Int. Cl.³ F02C *9/00*

U.S. Cl. 60—39.23 **4 Claims**



1. In a register plate throttle which surrounds a fuel injection nozzle, the improvement comprising:

(a) means for providing a first, relatively low, swirl angle at a relatively high airflow regime;

(b) means for providing a second, relatively high swirl angle at a relatively low airflow regime; and

(c) means for terminating airflow in a third airflow regime.

4. A method of operating a gas turbine engine comprising the following steps:

(a) using a register plate swirler which surrounds at least one fuel nozzle in at least one combustor, providing a relatively high airflow therethrough at a relatively low swirl angle for

(i) providing a fuel-air mixture for combustion in the combustor having a fuel-air ratio which is less than stoichiometric and

(ii) providing a relatively reduced residence time of the fuel-air mixture in the combustor;

(b) using the register plate swirler, providing a relatively low airflow therethrough at a relatively high swirl angle for

(i) providing a fuel air mixture for combustion in the combustor having a fuel-air ratio which is greater than stoichiometric for less-than-peak NOx production,

(ii) providing a relatively increased residence time of the fuel-air mixture in the combustor; and

(c) using the register plate swirler, terminating airflow therethrough for providing a rich mixture to the combustor.

4,534,167

INLET COWL ATTACHMENT FOR JET ENGINE

Wan T. Chee, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

PCT No. PCT/US82/01816, § 371 Date Dec. 27, 1982, § 102(e) Date Dec. 27, 1982, PCT Pub. No. WO84/02507, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 27, 1982, Ser. No. 485,575

Int. Cl.³ F02C *7/20*

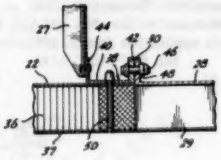
U.S. Cl. 60—226.1 **7 Claims**

1. In a gas turbine engine surrounded by a cowl, said cowl having an inlet portion of generally annular shape and including an interior skin and also having an engine containment portion, a system for removably attaching said inlet portion to said engine containment portion includes:

an inlet-mounting flange extending from said engine containment portion;

an inlet-mounting ring of substantially U-shaped cross section having a web and first and second legs extending

orthogonally from said web, said first leg abutting said engine-mounting flange and being removably affixed thereto, said web overlying and being removably affixed to a first surface of the interior skin of said inlet portion so



as to hold said inlet portion and engine containment portion in immediate adjacency; and

sound-absorbing means affixed to a second surface of said interior skin in an area immediately adjacent said engine containment portion.

4,534,168

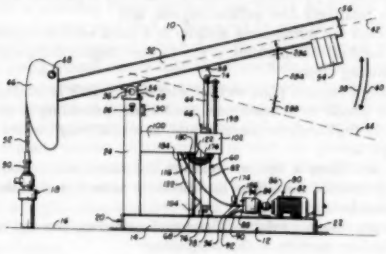
PUMP JACK

Newby O. Brantly, 210 W. Highview, Frederick, Okla. 73542

Filed Jun. 30, 1983, Ser. No. 509,294

Int. Cl.[3] **F04B** *47/04;* **F15B** *13/042*

U.S. Cl. 60—369 **8 Claims**



1. A pump jack, comprising:

a pump jack base;

a walking beam pivotally mounted on the pump jack base for oscillation in a vertical arc between first and second end positions of the walking beam;

pumping means including a fluid reservoir for providing a source of pressurized hydraulic fluid at a substantially constant flow rate, the pressurized hydraulic fluid being supplied at a pressure port of the pumping means;

a first hydraulic actuating cylinder connected between the walking beam and the pump jack base for pivoting the walking beam in a first direction toward the first end position of the walking beam in response to pressurized hydraulic fluid received at a first fluid port of the first hydraulic actuating cylinder and for pivoting the walking beam in a second direction toward the second end position of the walking beam in response to pressurized hydraulic fluid received at a second fluid port of the first hydraulic actuating cylinder;

a first hydraulic valve having an input port fluidly connected to the pressure port of the pumping means, an exhaust port connected to the fluid reservoir, a first output port fluidly connected to the first fluid port of the first hydraulic actuating cylinder, and a second output port fluidly connected to the second fluid port of the first hydraulic actuating cylinder, the first hydraulic valve having an operating member movable to a first position to internally fluidly connect the input port of the first hydraulic valve to the first output port thereof and movable to a second position to internally fluidly connect the input port of the first hydraulic valve to the second output port thereof, wherein the first hydraulic valve is characterized as being of the type wherein the operating member thereof is disposable in a neutral position between said first and second positions of said operating member of the first hydraulic valve to block fluid flow through the first hydraulic valve and wherein the first hydraulic valve is further characterized as being of the type having means providing fluid proportioning characteristics at such times that the operating member of the first hydraulic valve is positioned between the neutral position and an end position thereof for transmitting pressurized hydraulic fluid from the input port of the first hydraulic valve to an output port thereof in proportion to the displacement of the operating member thereof from the neutral position of the operating member;

a second hydraulic actuating cylinder having a piston rod mechanically coupled to the operating member of the first hydraulic valve for moving the first hydraulic valve operating member to the first position thereof in response to pressurized hydraulic fluid received at a first fluid port of the second hydraulic actuating cylinder and for moving the first hydraulic valve operating member to the second position thereof in response to pressurized hydraulic fluid received at a second fluid port of the second hydraulic actuating cylinder;

a second hydraulic valve having an input port fluidly connected to the pressure port of the pumping means, a first output port fluidly connected to the first fluid port of the second hydraulic actuating cylinder, and a second output port fluidly connected to the second fluid port of the second hydraulic actuating cylinder, the second hydraulic valve having an operating member movable to a first position to internally connect the second hydraulic valve input port to the second hydraulic valve first output port and movable to a second position to internally connect the second hydraulic valve input port to the second hydraulic valve second output port; and

second hydraulic valve control means mechanically coupling the operating member of the second hydraulic valve to the walking beam for moving the second hydraulic valve operating member to the second position thereof during pivotation of the walking beam toward the first end position thereof and for moving the second hydraulic valve operating member to the first position thereof during pivotation of the walking beam toward the second end position thereof, the second hydraulic valve control means comprising:

a mounting plate disposed below a portion of the walking beam;

a sleeve mounted on the mounting plate for axial movement along a substantially vertical axis between upper and lower sleeve positions, said sleeve having an upper end facing the walking beam and a lower end facing away from the walking beam;

a control rod mechanically coupled to the walking beam and passing through the sleeve for substantially vertical reciprocation through said sleeve in coordination with the oscillation of the walking beam;

first sleeve engagement means mounted on the control rod above said sleeve for engaging the upper end of the sleeve and forcing the sleeve downwardly during one half cycle of the reciprocation of the control rod through the sleeve; and

second sleeve engagement means mounted on the control rod below said sleeve for engaging the lower end of the sleeve and forcing the sleeve upwardly during the other half cycle of the reciprocation of the control rod through the sleeve;

wherein the second hydraulic valve is mounted on the mounting plate and positioned thereon relative to said sleeve for movement of the operating member of the second hydraulic valve between said first and second

positions thereof along a line parallel to the axis of the sleeve; and wherein said sleeve is connected to the operating member of the second hydraulic valve for shifting the second hydraulic valve operating member between said first and second positions thereof.

4,534,169

POWER TRANSMISSION SYSTEM

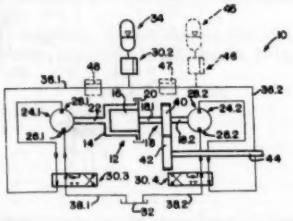
Michael S. Hunt, Edenvale, South Africa, assignor to South African Inventions Development Corp., Transvaal, South Africa

Filed Jun. 4, 1982, Ser. No. 385,190

Claims priority, application South Africa, Jun. 11, 1981, 81/3941; Apr. 1, 1982, 82/2259

Int. Cl.³ B60K *9/00*; F01B *21/00*

U.S. Cl. 60—414 **10 Claims**



1. A power transmission system comprising an electric motor for connection to an electric power supply, the motor comprising two relatively rotatable motor portions provided with a clutch whereby they are lockable relative to each other, each of which motor portions is rotatable relative to an anchorage or mounting for the motor, coaxially with the axis of rotation between the two motor portions, one of the motor portions being provided with a power output for the system, and the other being drivingly connected to at least one hydrostatic machine capable of acting as a pump or as a motor, and in liquid flow communication with at least one hydrostatic accumulator and a liquid source, the hydrostatic machine having a three-way valve in circuit therewith whereby the connections of the hydrostatic machine to the liquid source and accumulator can be reversed, and whereby it can be short-circuited and isolated simultaneously from said accumulator and source.

4,534,170

BRAKE-PRESSURE GENERATOR SYSTEM

Guy Meynier, Aulnay sur Bois, France, assignor to Societe Anonyme D. B. A., Paris, France

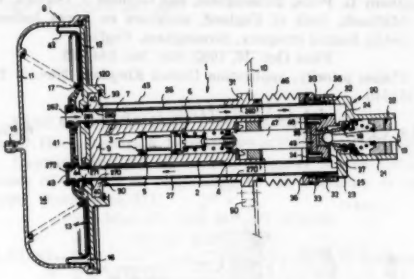
Filed Dec. 12, 1983, Ser. No. 560,684

Claims priority, application France, Dec. 23, 1982, 82 21685

Int. Cl.³ B60T *13/00*

U.S. Cl. 60—547.1 **8 Claims**

1. A brake-pressure generator system, comprising a master cylinder including a master cylinder body containing at least one piston for at least one brake circuit, a power-assistance servo-motor associated with the master cylinder and supported on a first axial end of the master cylinder and which incorporates a housing divided internally into two chambers by a movable wall structure forming a piston, and distribution valve means for controlling the servo-motor and actuable by a controlled push member, the distribution valve means comprising a valve body connected to said movable wall structure, wherein said valve means is arranged on an axial end of the master cylinder opposite said first axial end and said valve body is axially displacable and connected to said movable wall structure by at least one pair of rigid elongated conduits which respecitvely make the valve means communicate with each of



the two chambers of the servo-motor, and each conduit having one end fastened to said movable wall structure.

4,534,171

HYDRAULIC DUAL-CIRCUIT TANDEM MAIN BRAKE CYLINDER

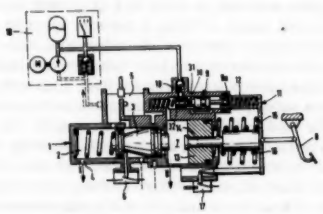
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 548,735

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1983, 3301042

Int. Cl.³ B60T *13/14*

U.S. Cl. 60—551 **12 Claims**

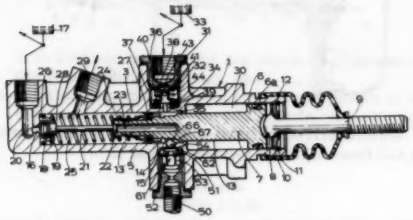


1. A hydraulic dual-circuit brake system including first and second main brake cylinders in tandem, comprising at least one brake piston for a closed brake circuit, a brake fluid control valve which is actuatable via a brake pedal-actuated body part in combination with a travel simulator spring which acts upon said body part and said control valve, said control valve controls a control pressure fluid flow from a control pressure source into a pressure chamber which is adjoined by a control face of at least one brake piston, and an auxiliary piston adjoining the pressure chamber, said auxiliary piston including a tappet which passes through and is displaceably supported in the auxiliary piston and which is actuated by movement of said pedal and said body part, a progressive spring fastened between one side of the auxiliary piston and said brake pedal-actuated body part remote from the pressure chamber and coaxial with the tappet passing through said auxiliary piston, characterized in that said progressive spring is directed against said auxiliary piston and has a highly progressive spring characteristic and as a result effects a highly progressive pedal characteristic.

4,534,172
MASTER CYLINDER ASSEMBLY FOR A VEHICLE HYDRAULIC BRAKING SYSTEM

Anthony G. Price, Birmingham, and Graham J. Gornall, West Midlands, both of England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Oct. 24, 1983, Ser. No. 544,955
Claims priority, application United Kingdom, Nov. 2, 1982, 8231340
Int. Cl.³ B60T 11/20, 15/38, 15/46
U.S. Cl. 60—578 6 Claims

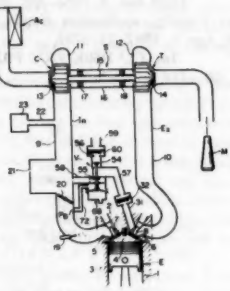


1. A master cylinder assembly for a vehicle hydraulic braking system comprising first and second separate master cylinders for applying respective brakes, a transfer passage connecting said master cylinders and through which fluid can be transferred between said master cylinders when both said master cylinders are operated simultaneously in order to compensate for differential wear of friction linings of said brakes, and transfer valve means for cutting-off communication between said master cylinders when one of said master cylinders is operated on its own, wherein each said master cylinder comprises a housing having a bore of stepped outline, a pedal-operated piston of complementary stepped outline working in said bore, said piston having an inner end of smaller area carrying a first seal and an outer end of greater area carrying a second seal, means defining a pressure space in said bore in advance of said inner end of said piston, means defining a quick-fill chamber in said bore between said inner and outer ends of said piston, a reservoir for fluid, a normally-open recuperation valve providing communication between said reservoir for fluid and said pressure space at least when the piston is in a retracted position, and a pressure-limiting valve assembly between said quick-fill chamber and said reservoir or a second reservoir, said pressure-limiting valve assembly being closed, at least when said piston is in the retracted position, a one-way valve incorporated in said pressure-limiting valve assembly and movable between an open position to provide communication between said respective reservoir and said quick-fill chamber through said pressure-limiting valve assembly when the piston is in the retracted position, and a closed position in response to movement of said piston in a brake-applying direction to isolate the said respective reservoir from said quick-fill chamber, with said first seal preventing fluid communication from said pressure space to said quick-fill chamber when said piston is moved in said brake-applying direction, said pressure limiting valve assembly being adapted to open at a threshold value pressure when said piston is moved in said brake-applying direction and following closure of said recuperation valve and the transfer of fluid from said quick-fill chamber to said pressure space to take up the braking clearances, with further movement of said piston in the same direction pressurizing fluid in said pressure space to apply said brake, and wherein the said two quick-fill chambers are connected through said transfer passage so that fluid can be transferred between said two quick-fill chambers when said master cylinders are operated simultaneously at least until said threshold value is attained.

4,534,173
MEANS FOR SUPPLYING A SECONDARY AIR IN AN INTERNAL COMBUSTION ENGINE WHICH IS PROVIDED WITH A TURBO CHARGER

Hiroaki Tsukamoto, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed Oct. 19, 1982, Ser. No. 435,182
Claims priority, application Japan, Oct. 19, 1981, 56-166920; Nov. 2, 1981, 56-176073; Feb. 15, 1982, 57-22451
Int. Cl.³ F02B 37/00
U.S. Cl. 60—606 4 Claims

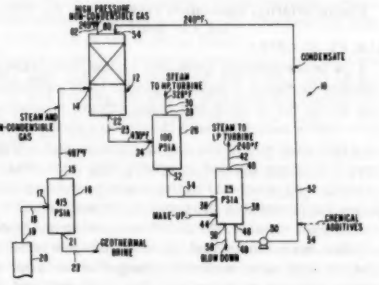


1. An internal combustion engine comprising: a turbocharger having a compressor for compressing sucked-in air flowing through an intake system in communication with a combustion chamber; means for controlling secondary air for purifying the exhaust gas, comprising a secondary air supply passage having one end in communication with an exhaust system, said exhaust system in communication with said combustion chamber, said secondary air supply passage having a first passage opened at an intake passage portion between said turbocharger and a throttle valve, and a second passage in communication with the atmosphere, said secondary air supply passage having the other end in communication with the atmosphere and the intake passage portion through a switch means adapted to selectively switch between said first and second passages.

4,534,174
GEOTHERMAL REBOILER APPARATUS AND METHOD

Leon Awerbuch, San Francisco, and Victor C. Van der Mast, Lafayette, both of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Filed Nov. 25, 1983, Ser. No. 555,308
Int. Cl.³ F03G 7/00
U.S. Cl. 60—641.5 28 Claims



1. Apparatus for handling geothermal brine capable of being

flashed to form a vapor fraction containing steam and a non-condensible gas comprising: a direct contact reboiler; means coupled with the reboiler for directing the vapor fraction of flashed geothermal brine into the reboiler; means coupled with the reboiler for directing a condensate into the reboiler and into counter current flow relationship with the vapor fraction, whereby the condensate is heated by the vapor fraction and the steam is condensed and separated from the non-condensible gas; and means for coupling the reboiler to a work producing apparatus to permit the heated condensate from the reboiler to be directed toward said work producing apparatus for actuating the latter.

4,534,175

METHOD AND APPARATUS FOR THE ABSORPTION OF A GAS IN A LIQUID AND THEIR USE IN ENERGY CONVERSION CYCLES

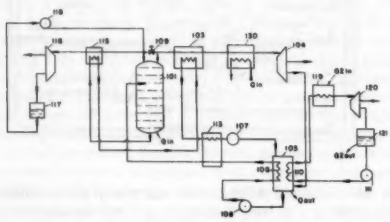
Abraham Kogan, Haifa, and Uri Moore, Ramat-Hasharon, both of Israel, assignors to Gason Energy Engineering Ltd., Tel-Aviv, Israel

Filed Mar. 7, 1983, Ser. No. 473,133

Claims priority, application Israel, Mar. 11, 1982, 65223; Dec. 1, 1982, 67389

Int. Cl.³ F01K *25/06*

U.S. Cl. 60—649 **23 Claims**



1. A method of effecting gradual absorption of a first fluid (herinafter "the gas") having a relatively low boiling point in a second fluid (hereinafter "the solvent") having a considerably higher boiling point than the gas, under conditions as close as possible to thermodynamically reversible conditions, with maximal recovery of the released heat of absorption, so as to obtain a high enthalpy solution or mixture of solution and gas at relatively high temperature and pressure; comprising the steps of:

(a) passing a flow of the gas through a plurality of discrete stages from a first terminal stage to a second terminal stage and, in counter-current thereto, passing a flow of the solvent or a weak solution of the gas in the solvent through said stages from said second terminal stage to said first terminal stage, so as to establish in each of said stages an intimate contact between the gas and the solvent or said weak solution;

(b) withdrawing a strong solution of the gas in the solvent from said first terminal stage and recirculating it through some or all of the stages counter-currently to the flow of the weak solution and co-currently with the flow of said gas via a continuous conduit comprising heat exchange tubes disposed in said stages;

(c) dispersing the solvent or the weak solution of the gas in the solvent entering each stage by liquid spraying means suitably disposed with respect to said heat exchange tubes so as to form a film-like layer of said solvent or said weak solution on the outer surface of said heat exchange tubes, thereby to extract heat from some or all of said stages by indirect heat exchange through the walls of said tubes between said recirculated strong solution flowing therein and the liquid in said film-like layer;

(d) extracting additional amounts of heat from some or all of said stages by indirect heat exchange between the fluids in those stages and a coolant fluid or fluids, the temperature of said coolant fluid or fluids being thus raised; and

(e) withdrawing said recirculated strong solution from said second terminal stage as a high-enthalpy solution or mixture of solution and gas.

4,534,176

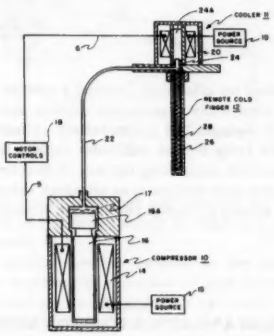
LINEAR RESONANCE CRYOGENIC COOLER

Stuart B. Horn; Richard A. Wright, both of Fairfax, and Howard L. Dunmire, Stafford, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 23, 1984, Ser. No. 593,948

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—6 **4 Claims**



1. A linear resonance cryogenic cooler means for producing optimized cooler expander waveforms in a closed cycle system cooler having reciprocating displacer-expander cooling, said means comprising:

a linear motor drive means comprised of a compressor linear drive motor and a cooler linear drive motor for driving a compressor near its resonance frequency for producing alternating pressure waves in a light cooling gas enclosed within said closed cycle system cooler and for simultaneously driving the displacer of a regenerator-displacer in a cold finger of said cooler in reciprocal motion wherein the reciprocal motion of said displacer is phase delayed from said alternating pressure waves by about 90° through repetitive cycles in which both compressor alternating pressure waves and the displacer reciprocal motion waves have essentially the same wave shape wherein said compressor linear drive motor has a compressor piston attached thereto in which the piston head is in direct contact with said gas and said cooler linear drive motor has a shaft attached thereto which is hard connected to said displacer; and

a waveform generator control means for selectively controlling said linear motor drive means to provide optimum wave shapes for optimum cooling wherein said compressor linear drive motor and said cooler linear drive motor respectively produce said alternating pressure waves and displacer reciprocal motion waves which have four relatively equal portions during about 90° of each repetitive cycle which is defined as a top dead center, a linear acceleration, a bottom dead center, and a linear acceleration back to the top dead center wherein said waveform generator control means varies the time of said four relatively equal portions and to control the acceleration rate to provide optimum cooling.

4,534,177

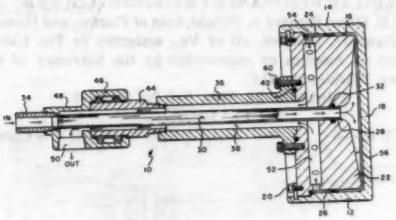
ULTRAHIGH VELOCITY WATER-COOLED COPPER SPINNER

Patrick J. Wooding, Moorestown, N.J., assignor to Wooding, Indian Mills, N.J.

Division of Ser. No. 311,043, Oct. 13, 1981, Pat. No. 4,468,931. This application Feb. 24, 1984, Ser. No. 582,400

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—64 **3 Claims**



1. A method for effectively cooling a spinner having a substantially cylindrically shaped outer surface upon which molten material impinges and a substantially cylindrically shaped inner surface lying behind said outer surface and in thermal contact therewith comprising the step of directing liquid coolant across said inner surface at an ultrahigh velocity of at least 10 feet per second to sweep away steam generated upon said inner surface.

4,534,178

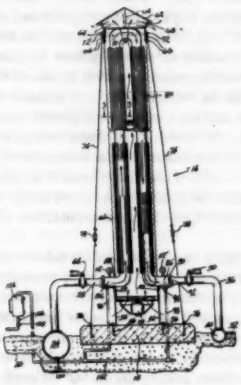
METHOD AND APPARATUS FOR REMOVING CONDENSATE AND OIL PARTICLES FROM A STREAM OF COMPRESSED AIR USED IN THE PRODUCTION OF SNOW

Joseph C. Tropeano; Joseph T. Tropeano, and Thomas F. Tropeano, all of 12 Revere St., Lexington, Mass. 02173

Division of Ser. No. 457,259, Jan. 12, 1983, Pat. No. 4,467,614. This application Apr. 11, 1984, Ser. No. 599,058

Int. Cl.³ B01D *9/04;* **F28C** *1/00*

U.S. Cl. 62—124 **1 Claim**



1. In an installation for making snow wherein a stream of compressed air and a stream of pressurized water are fed from a compressor station and a pumping station via separate lines to the nozzles of snow-making equipment where said compressed air and pressurized water are mixed to produce a stream of snow particles, a method for removing condensate and oil particles from said stream of compressed air comprising:

providing a stream of compressed air having oil particles and a condensate therein;

cooling said stream of compressed air so as to crystallize said condensate and allow said oil particles to adhere thereto;

throttling said stream of compressed air so as to form a holding zone;

heating said crystallized condensate and said oil particles in said holding zone so as to liquefy said crystallized condensate; and

separating out said liquid and oil particles from said stream of compressed air.

4,534,179

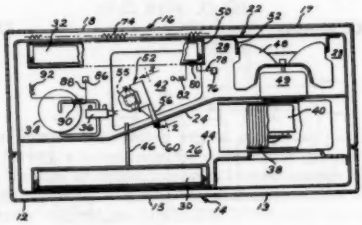
AIR CONDITIONING APPARATUS

George E. Stocking, and Walter J. Pohl, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Oct. 4, 1984, Ser. No. 657,612

Int. Cl.³ F25D *21/02*

U.S. Cl. 62—128 **2 Claims**



1. A self-contained refrigeration heat pump air conditioning unit operable in a heating and cooling cycle for conditioning the air of an enclosure comprising:

a chassis including a base member and a barrier dividing said chassis into an indoor compartment and an outdoor compartment;

indoor and outdoor heat exchangers mounted respectively in said indoor and outdoor compartments;

an indoor air moving means for recirculating enclosure air through said indoor compartment;

an outdoor air moving means for circulating air through said outdoor compartment;

a compressor mounted in said outdoor compartment;

means for selectively connecting said compressor to said heat exchangers whereby said outdoor heat exchanger functions as an evaporator during operation of the unit on the heating cycle and said indoor heat exchanger functions as an evaporator during the cooling cycle;

a condensate collection sump in said outdoor compartment formed in said base member;

means for directing condensate formed on said indoor and outdoor heat exchangers into said sump;

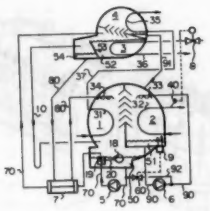
condensate disposal means arranged in said outdoor compartment including a housing, passageway means connected to said housing at one end and having an outlet at the other end positioned in an opening in said barrier so as to communicate with the indoor compartment, condensate lifting means arranged on said housing operable in the heating cycle for lifting condensate from said sump and directing it through said passageway in said indoor compartment into the path of air being circulated by said indoor fan where it is vaporized and directed through the relatively warm indoor heat exchanger functioning as a condenser in said heating cycle; and

control means rendering said condensate lifting means operable in said heating cycle including circuit means producing a signal when condensate present in said sump is not being transferred through said passageway to said indoor compartment.

4,534,180
ABSORPTION REFRIGERATION SYSTEM WITH SOLUTION FLOW CONTROL

Takashi Yasuda; Naoyuki Inoue, and Syouji Tanaka, all of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 565,195
Claims priority, application Japan, Dec. 27, 1982, 57-226656
Int. Cl.[3] F25B *15/00*
U.S. Cl. 62—141 21 Claims



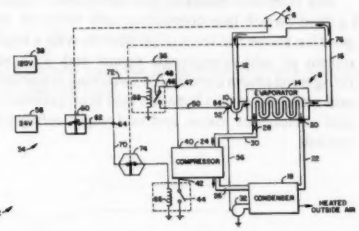
1. An absorption refrigeration system including a refrigerant evaporator, an absorber associated with said evaporator, a generator, a condenser associated with said generator, weak solution passage means for passing a weak solution to said generator from said absorber, strong solution passage means for passing a strong solution to said absorber from said generator, refrigerant passage means for circulating refrigerant through said evaporator, refrigerant return passage means for passing refrigerant from said condenser back to said evaporator, heating medium passage means for passing heating medium to said generator, heating control means for controlling said heating medium, a solution heat exchanger disposed in said strong solution passage means for preheating said weak solution passing therethrough, and solution flow control means for controlling the flow of said weak solution passing through said weak solution passage means, wherein said solution flow control means comprises sensing means for sensing the level of solution in said absorber indicative of the concentration of the solution in substantially inverse proportional relationship, and valve means disposed in said weak solution passage means through which said weak solution passes and responsive to said sensing means for varying the flow of said weak solution in such a manner that the flow of said weak solution decreases as the level of the solution in the absorber increases, which indicates a decreased concentration of the solution.

4,534,181
COOLING SYSTEM

Claude D. Brown, Grass Valley, Calif., assignor to BBC Industries, Inc., Grass Valley, Calif.

Filed Jan. 31, 1984, Ser. No. 575,961
Int. Cl.[3] F25D *17/00*
U.S. Cl. 62—180 3 Claims

1. A system for cooling an enclosed region comprising:
a vapor compression refrigeration loop including:
a compressor, and expansion valve, an evaporator and a condenser fluidly coupled in a closed loop;
a cool fluid propelling means, having an inlet and an outlet, for propelling a fluid along a cool fluid path past said evaporator to cool the fluid; and
a cool fluid supply conduit connecting an exit end of the cool fluid path to the region;
first and second higher voltage lines electrically connecting a higher voltage source to said cool fluid propelling means and to said compressor respectively;
first and second normally open relay switches connected along said first and second higher voltage lines;
a thermostat adapted to respond to the temperature in the region and assume a cold demand state according to the temperature in the region, said thermostat including an input terminal connected to a lower voltage source and an output terminal connected in parallel along first and second lower voltage lines to first and second relay actuators, said first and second relay actuators operably connected to said first and second relay switches;
a first relay switch actuator connected to said thermostat along the first lower voltage line, for closing said first relay switch so to actuate said cool fluid propelling means when said thermostat is in the cold demand state;
second relay switch actuator connected to said thermostat along the second lower voltage line, for closing said second relay switch so to activate said compressor when said thermostat is in the cold demand state;

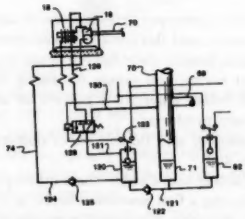


a temperature sensor arranged and adapted to sense the temperature of the fluid passing through said cool fluid supply conduit; and
duct switch means, operably coupled to the temperature sensor, for interrupting a portion of said lower voltage line, to deenergize said second relay switch actuator thereby disconnecting said compressor from the higher voltage source, when the temperature sensed by said temperature sensor is below a first temperature and to reconnect the interrupted portion of said second lower voltage line when the temperature sensed by said temperature sensor is above a second temperature, whereby said compressor is cycled on and off while said thermostat is in said cold demand state.

4,534,182
OIL COLLECTION/RECIRCULATION FOR VAPOR-COMPRESSION REFRIGERATION SYSTEM

Samuel G. Toub, 14114 Dallas Pkwy./Suite 470, Dallas, Tex. 75240; James L. Gilliland, Jr., and Homer W. Holder, both of 3614 Security, Garland, Tex. 75042

Filed May 7, 1982, Ser. No. 375,721
Int. Cl.[3] F25B *31/00*
U.S. Cl. 62—193 12 Claims



1. A vapor-compression air conditioning system for a multi-story building comprising:
(a) a plurality of evaporator units vertically separated from each other;
(b) condensor means;

(c) oil lubricated compressor means disposed at a vertical elevation above said plurality of evaporator units;

(d) conduit means interconnecting said plurality of evaporator units, condenser means and compressor means for separating lubricant oil from vapor refrigerant, said conduit means comprising:

(1) a straight-line and generally vertical vapor refrigerant return conduit for conducting only said vapor refrigerant from said plurality of evaporator units to said compressor means, said vapor refrigerant return conduit having no trap means therein;

(2) reservoir means disposed at a vertical elevation below said vapor refrigerant return conduit; and

(3) an oil return line for conducting said lubricant oil from said reservoir means to said compressor means; and

(f) a fluid switch interconnecting said reservoir means at a position above the level of oil therein with a high pressure output of said compressor means and with said vapor refrigerant return conduit for switching communication of said reservoir means between said high pressure output of said compressor means and said vapor refrigerant return conduit.

4,534,183

CONTINUOUS FREEZING APPARATUS

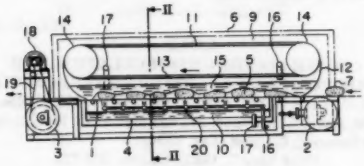
Masahide Hashimoto; Yoshitaka Kurisu; Shigeo Zuiki, and Yoshio Sasaki, all of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1984, Ser. No. 654,026

Claims priority, application Japan, Sep. 27, 1983, 58-181689; Sep. 27, 1983, 58-181690; Sep. 27, 1983, 58-181691; Apr. 4, 1984, 59-50390[U]

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—374 **7 Claims**



1. A continuous freezing apparatus comprising:

a belt conveyor for carrying products to be frozen along a path;

a flexible sheet conveyor arranged above and parallel to said belt conveyor, said flexible sheet conveyor being formed of a continuous flexible sheet having upper and lower paths and a constant width, and means for filling said flexible sheet with cold brine, whereby a portion of said flexible sheet contacts said products;

means for moving said flexible sheet conveyor and said belt conveyor; and

means for guiding said flexible sheet conveyor, said means for guiding having a first position wherein a width of said flexible sheet conveyor substantially equals said width of said flexible sheet, said means for guiding having a second position wherein said width of said flexible sheet conveyor is less than said width of said flexible sheet, said second position being along a portion of said lower run where said flexible sheet contacts said products to slacken said flexible sheet, whereby brine can fill said slackened flexible sheet.

4,534,184

DEVICE FOR COOLING MOLDS

Arnoldus W. J. Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

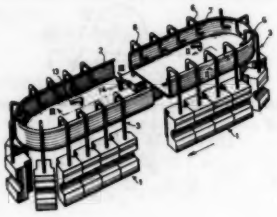
Division of Ser. No. 386,279, Jun. 8, 1982, Pat. No. 4,439,990.

This application Apr. 2, 1984, Ser. No. 596,031

Claims priority, application Netherlands, Jun. 11, 1981, 8102823

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—376 **7 Claims**



1. A device for cooling plastic molds having vertical intake and discharge fluid tubes in communication with a coolant cavity in each mold, the molds being arranged for horizontal travel in a closed loop, the device comprising a static coolant reservoir positioned above the molds, and the fluid intake tube of each mold being shaped as a siphon tube and being positioned such that the entrance end thereof passes over the edge of the static reservoir and in communication with the coolant in said static reservoir, a static coolant collector positioned below the molds and in communication with the mold fluid discharge tubes, so that by siphon action coolant from the static coolant reservoir passes through the intake tubes, the molds and through the discharge tubes and is discharged in said static coolant collector.

4,534,185

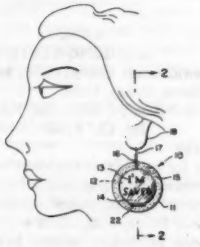
EAR FRAME

James B. Berry, and George Spector, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Jun. 10, 1983, Ser. No. 503,282

Int. Cl.³ A44C *7/00, 15/00*

U.S. Cl. 63—1 R **1 Claim**

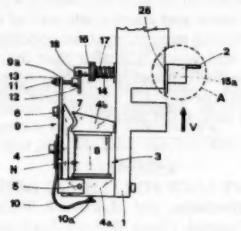


1. An ear pendant assembly comprising a plate, a flexible pad secured to the rear of said plate, said pad having means for storing various display cards, a moveable window closure mounted to the front of said plate forming a display cavity for one of said cards, said storing means including a rear opening in said pad smaller than each card providing access to a storage spacer larger than each card, said opening having a flexible flange of material manually distortable for allowing passage of said cards and able to recover its shape to retain said cards in said space, said assembly being in further combination with a chain adapted to be secured to a person's ear.

4,534,186
ELECTROMECHANICAL DEVICE FOR SELECTING THE METAL STRAPS THAT CARRY INTO OPERATION THE NEEDLES OF AN AUTOMATIC STRAIGHT BAR KNITTING MACHINE

Benito Stoppazzini, Sala Bolognese, Italy, assignor to E.M.M. s.r.l. Emiliana Macchine Maglierie, Bologna, Italy

Filed Mar. 19, 1984, Ser. No. 590,737
Int. Cl.³ D04B *7/00, 15/66*
U.S. Cl. 66—75.2 **3 Claims**



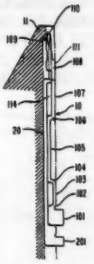
1. Electromechanical device for selecting the metal straps that carry into operation the needles of an automatic straight bar knitting machine, each of the said metal straps being provided with at least two butts, one of which positioned in the lower part and the other centrally, the latter being destined, when intercepted by selection means, to cause the metal strap concerned to undergo a movement with the consequential positioning of the lower butt in the path of a fixed cam provided in the carriage of the machine, the interception of which against the said lower butt causes a further movement, in the same direction as before, of the said metal strap and the carrying into operation of the relevant needle; the said device being characterized by the fact that it comprises: an electromagnet locked to a plate provided in the said carriage, the armature of which is pivotally connected to the magnetic core; first elastic means exerting on the said armature an effect in contrast with the magnetic force applied at length thereon; a blade locked to the said armature and projecting there from; a cylindrical element locked perpendicularly to the part of the said blade that protrudes from the armature, and provided at the bottom end with a plate; a rod that passes freely across a hole drilled in the said plate, provided on one side of the latter with means for selecting a corresponding metal strap, as well as with a transverse locator member that defines when abutting with the said plate, the non-operative position of the said selection means, and on the opposite side of the plate with respect to the said selection means, with a transverse slit destined to accept one part of the edge of the said plate; and second elastic means that act on the said rod in contrast with the action exerted on the latter by the said plate in consequence of the excitation of the coil of the electromagnet.

4,534,187
SLIDING LATCH NEEDLES

Masatoshi Sawazaki, and Shozo Yorisue, both of Kobe, Japan, assignors to Precision Fukuhara Works, Ltd., Kobe, Japan

Filed Sep. 10, 1984, Ser. No. 648,931
Claims priority, application Japan, Oct. 6, 1983, 58-187529
Int. Cl.³ D04B *35/04*
U.S. Cl. 66—120 **6 Claims**

1. A sliding latch needle assembly comprising cooperative hook and latch sections, the hook section having an elongated shank member with a hook at one end thereof and an operating butt extending from its other end, and the latch section also having an elongated shank member with a latch at one end thereof and an operating butt extending from its other end, the butts extending in like direction from the shank members cor-

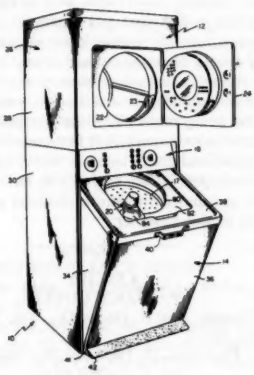


responding thereto with the hook butts disposed between the latch butts and the latch.

4,534,188
TILT WASHER WITH AUTOMATIC LID

Robert M. Fey, Rocky Face, Ga., assignor to Speed Queen Company, Ripon, Wis.

Filed May 31, 1984, Ser. No. 615,859
Int. Cl.³ D06F *29/02*
U.S. Cl. 68—3 R **15 Claims**



1. In combination:

a clothes washer having a cabinet top with an access opening, a cabinet front, and cabinet sides;

a base pivotally supporting said washer wherein said washer can be tilted from an upright position used for washing to a forward tilted position used for loading and unloading clothes through said opening;

a lid seated in slidable engagement on said cabinet top in said upright washing position to cover said opening; and

means connected to said lid for limiting forward movement of said lid wherein, when said washer is tilted forward causing said cabinet top to move forward, said cabinet top slides underneath said lid thereby using the movement of said washer to automatically remove said lid from said opening.

4,534,189

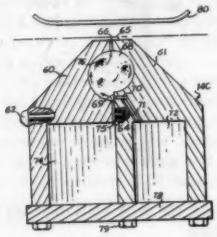
APPARATUS FOR APPLYING CHEMICALS TO TEXTILES

Albert F. Clifford, Rte. 4, Box 1015, LaFayette, Ga. 30728

Filed Jan. 5, 1984, Ser. No. 568,571

Int. Cl.³ D06B *5/08*

U.S. Cl. 68—5 D **4 Claims**



1. An applicator for applying a liquid chemical to textile goods, wherein said textile goods move across said applicator while said applicator discharges said liquid chemical, said applicator including a body, a nozzle face at one end of said body for receiving textile goods thereagainst, a mixing chamber defined within said body, a slot defined in said body for connecting said mixing chamber to said nozzle face, and means for supplying a metered quantity of said liquid chemical and a quantity of gas under pressure to said mixing chamber, said body further defining a first cavity and a second cavity therein, said second cavity constituting said means for supplying a metered quantity of said liquid chemical, said first cavity constituting said means for supplying a quantity of gas under pressure, first passage means for connecting said first cavity with said mixing chamber and second passage means for connecting said second cavity with said mixing chamber, said body including a first part and a second part, said mixing chamber being generally cylindrical and including a first portion of said mixing chamber defined in said first part and having a first radius, a second portion of said mixing chamber defined in said second part and having a second radius, said second radius being larger than said first radius for defining a step in said mixing chamber, said first cavity being in said first part and said second cavity being in said second part, said first passage means opening into said mixing chamber on said step so that said gas under pressure is directed generally tangentially of said mixing chamber.

4,534,190

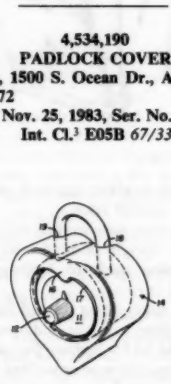
PADLOCK COVER

Judith A. Stanich, 1500 S. Ocean Dr., Apt. #1103, Pompano Beach, Fla. 33072

Filed Nov. 25, 1983, Ser. No. 554,903

Int. Cl.³ E05B *67/33*

U.S. Cl. 70—54 **6 Claims**



1. For attachment to a padlock having a generally cylindrical body and an inverted U-shaped shackle having opposite legs extending up from said body, a cover of deformable and resilient material having:

an annular side wall having opposite ends and having a generally cylindrical inside surface between said ends which is substantially complementary to said body of the padlock to snugly engage the latter;

said cover being open at one end of said annular side wall;

said side wall of the cover having a pair of circumferentially spaced parallel slots therein which are open at said one end of the cover and extend longitudinally of the side wall for slidably receiving the opposite legs of the shackle of the padlock when the body of the padlock is inserted from said one end inside said annular side wall of the cover;

and said cover having an opening at the opposite end of said annular side wall which is smaller than the body of the padlock and radially inwardly extending lip means at said last-mentioned opening for engagement with a corresponding end face of the padlock body.

4,534,191

SECURITY LOCK FOR SLIDING DOORS

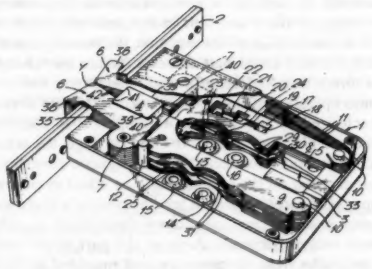
John Rogers, Staffordshire, and Malcolm J. White, Staffordshire, both of England, Chuck & Son's Lock and Safe Co., London, England

Filed Jun. 7, 1983, Ser. No. 501,939

Claims priority, application United Kingdom, Jun. 9, 1982, 8216726

Int. Cl.³ E05B *63/14*

U.S. Cl. 70—116 **8 Claims**



1. A lock comprising: a casing having two opposite faces corresponding to opposite directions of approach to the lock when fitted to a closure; a pair of hook bolts pivoted within said casing and having hook portions extending out of said casing arranged to be pivoted in mutually opposite senses between unlocking and locking position; a reciprocable slide within said casing arranged to be moved between first and second positions in response to corresponding turning movement of a correct key; the slide being arranged to be thrust against respective first portions of the bolts during movement from its first to its second said position thereby to pivot the bolts from their unlocking to their locking positions, a portion of the slide lying between the bolts when the slide is in its second said position thereby to prevent pivotal movement of the bolts from their locking to their unlocking positions, and the slide being arranged to engage respective second portions of the bolts during movement from its second to its first said position thereby to pivot the bolts from their locking to their unlocking positions; and a key-recognition mechanism comprising a plurality of movable detainers arranged to be set in predetermined relative positions when engaged by a correct key, the detainers serving to block the aforesaid movement of the slide except when they are set in their said predetermined relative positions, said detainers being provided as two sets of pivoted levers within said casing, a first set of said levers being provided with pockets and gates for cooperation with an abut-

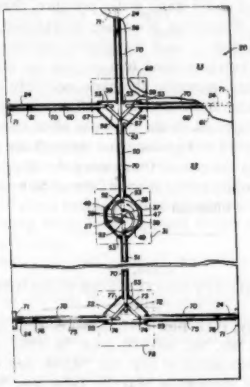
ment on the slide so as normally to block the aforesaid movement of the slide, and the second set of said levers being linked to the first set such that pivotal movemert of the second set is transmitted into pivotal movement of the first set; the first set of levers being engageable by a correct key when inserted through one of said faces of the casing to pivot those levers into predetermined relative positions in which they permit the movement of the slide; and the second set of levers being engageable by the same correct key when inserted through the opposite face of the casing to pivot those levers such as to pivot the first set of levers into the same predetermined relative positions.

4,534,192

SECURITY DOOR

Harry F. Harshbarger, Robertsdale; John L. Kurz, McConnellsburg, and Patrick J. Young, Defiance, all of Pa., assignors to JGR Enterprises, Inc., Fort Littleton, Pa.

Filed Jan. 19, 1983, Ser. No. 459,236
Int. Cl.³ E05B *63/14*
U.S. Cl. 70—118 **14 Claims**



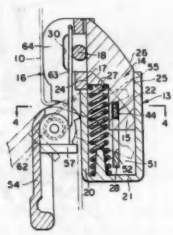
1. In a security door having a plurality of locking bolts adapted to be extended beyond edges of the door into keeper openings of a door frame and to be retracted to non-locking positions, a drive linkage for the bolt on the door operable to extend and retract all of the bolts in unison, and an operating assembly for the drive linkage, said assembly comprising a support plate fixed to the door and having an annular portion, a rotational spindle assembly bodily supported on the annular portion for rotation around the annular portion, a camming element secured to the spindle assembly to turn therewith and having connections with parts of said linkage to operate the same during rotation of the camming element to operate said bolts, a rotational handle fixed to the spindle assembly adjacent to one side of the door and operable to rotate the spindle assembly in opposite directions sufficiently to move said bolts to and from their extended locking and retracted positions, a key operator fixed on the other side of the door and having a turnable cylinder and projecting tab substantially coaxial with the spindle assembly, a rotational element journaled on the spindle assembly coaxially and being drivingly coupled to said tab, and means forming a rotational lost motion connection between said rotational element coupled with the tab and said spindle assembly including a cross-slot in said rotational element, and a radial drive element carried by the spindle assembly extending into the cross-slot, whereby the cylinder and tab when turned by a key through 360° in either direction can cause lost motion rotation of said rotational element for 180° prior to imparting 180° rotation to the spindle assembly and camming element to operate said bolts.

4,534,193

LOCK MECHANISM FOR THE GLOVEBOX DOOR OF AN AUTOMOBILE

Yukihito Takemura, and Tomohide Niimi, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 22, 1982, Ser. No. 452,135
Int. Cl.³ B60R *25/02*
U.S. Cl. 70—218 **5 Claims**



1. A lock mechanism for use in the glovebox door of an automobile, comprising:

a pull-handle having a pawl;

a lock-bar biased in a locked position through a single spring and adapted to slide within a guide of a frame structure or main body mounted on the glovebox door with pivoting motion of said pull-handle

cylinder type safety lock means including a rotor having a crank at one end thereof and a casing provided in said main body, said rotor being rotatably mounted within said casing, said guide and said lock bar having elongated through apertures extending in a first direction, and passing through in a second direction, respectively; and

a locking plate disposed crosswise to and held in a biased position by said lock bar and having one end portion thereof engaged with said crank and having the other end portion extending through each of said through apertures and outwardly on the side opposite to that where said cylinder type safety lock means is located, said other end portion of said locking plate being engaged by said pawl of said pull-handle when said cylinder type safety lock means are in the unlocked position, and being released from engagement with said pawl of said pull-handle when said cylinder type safety lock means are in the locked position.

4,534,194

ELECTRONIC LOCK SYSTEM

Kemal Aydin, Little Falls, N.J., assignor to Kadex, Incorporated, New York, N.Y.

Division of Ser. No. 244,316, Mar. 16, 1981, which is a division of Ser. No. 75,957, Sep. 17, 1979, which is a division of Ser. No. 849,163, Nov. 17, 1979, Pat. No. 4,117,657, which is a continuation of Ser. No. 677,105, Apr. 16, 1976, abandoned. This application Oct. 21, 1983, Ser. No. 544,288
Int. Cl.³ E05B *49/02*
U.S. Cl. 70—278 **5 Claims**

1. A locking system for a door comprising,

a lock having a bolt and an operating mechanism therefor adapted to be mounted in said door,

a key having code stored thereon including a key code,

a key reader in said door and including sensing means adapted to receive said key and read said code,

control means in said door coupled between said sensing means and said operating mechanism and adapted to enable or disable said operating mechanism,

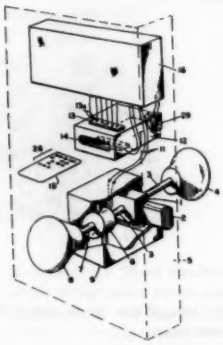
said control means including a code register, a microprocessor, a read-only memory, and a read/write memory,

said microprocessor including a data bus and an address bus

with said read-only memory being coupled with said data bus and said address bus and storing a control program for said microprocessor,

said code register being coupled with said sensing means and with said data bus and being adapted to store the key code read by the sensing means from said key,

said read/write memory being coupled with said address bus



and said data bus and having a first code stored therein at a predetermined memory location,

said microprocessor being operative under program control in response to the insertion of a key into said reader to compare said first code stored at said memory location with the key code stored in said code register and to enable said operating mechanism if said key code and said first code are the same.

4,534,195

MECHANICAL LOCK HAVING A VARIABLE KEY

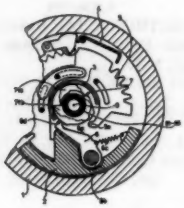
Kurt Ehrat, Steinmaur, Switzerland, assignor to GRETAG Aktiengesellschaft, Regensdorf, Switzerland

Filed Feb. 8, 1983, Ser. No. 464,940

Claims priority, application Switzerland, Feb. 19, 1982, 1048/82

Int. Cl.³ E05B *37/00*

U.S. Cl. 70—316 **13 Claims**



1. A mechanical lock comprising a key having variable key information elements to be scanned during rotation of the key around the axis of the lock, each of the key information elements being in the form of a cam plate coaxially located relative to the axis of the lock, said cam plate discretely adjustable to individual angular positions, said cam plates each having a surface portion and a plurality of stepped portions of different radii for determining the multiple variation of key information per information element in the individual angular positions.

4,534,196

METHOD FOR MANUFACTURING A MOLD

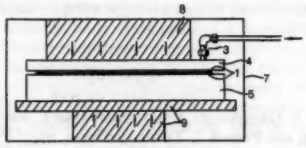
Shinichiro Kiyoto, and Chikara Fujiwara, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 521,315

Claims priority, application Japan, Oct. 7, 1982, 57-175319

Int. Cl.³ B21D *22/10*

U.S. Cl. 72—61 **2 Claims**



1. A method for manufacturing hollow mold to be used when titanium alloy powder is filled in the mold and the powder is hot pressed under static water pressure, characterized in that two sheets of titanium plates are overlapped, their edges are welded together to seal the plates together with a gas supplying pipe being welded to one part of the peripheral edges of said plate assembly, the plate assembly is placed between two molds of the desired configuration and pressure applied, heat is applied to the titanium plate assembly to the shaping temperature and gas supplied through the pipe to exert pressure between the plates, thus casing the titanium plates to expand in conformity to the shape of the mold by super-plastic shaping to form a titanium alloy mold.

4,534,197

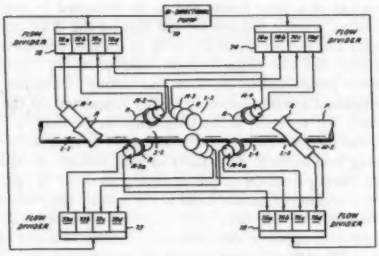
METHOD AND APPARATUS FOR STRAIGHTENING PIPE

Brown J. Woolley, P.O. Box 1249, Kilgore, Tex. 75662

Continuation of Ser. No. 360,940, Mar. 23, 1982, abandoned, which is a continuation of Ser. No. 79,548, Sep. 27, 1979, abandoned. This application May 29, 1984, Ser. No. 615,038

Int. Cl.³ B21D *3/04*

U.S. Cl. 72—98 **13 Claims**



13. An apparatus for straightening an elongated element of a circular cross section in a continuous operation as the element is moving through the apparatus in a horizontal direction, said apparatus comprising:

a main frame structure,

at least a pair of horizontally spaced inner roll stands within the frame structure on one side of the element, each inner roll stand having a roll for contacting the element as the element moves through the apparatus in a horizontal direction,

means mounting each inner roll stand on said one side of the element for independent individual movement in a hori-

zontal direction parallel to the longitudinal axis of the element,

a central roll stand within the frame structure located on the opposed side of the element and positioned longitudinally along the element between the pair of inner roll stands on said one side of the element, said central roll stand having a roll for engaging the element,

a pair of outer roll stands within the frame structure on the opposed side of the element and on opposite sides of the center roll stand and horizontally outwardly of said inner roll stands, each outer roll stand having a roll for engaging the element to be straightened,

means mounting each outer roll stand for independent movement in a horizontal direction parallel to the longitudinal axis of said element,

means mounting the roll stands on one of said sides of the element for individual vertical movement whereby the rolls thereof may engage the element to exert a pressure tranversely on the element,

independent actuating means operatively connected to the mounting means for each of the roll stands to move an associated roll stand in its respective direction of movement independently of the other roll stands,

the operation of the actuating means for each inner roll stand moving such inner roll stand in a horizontal direction relative to the central roll stand to change the effective lever arm formed between the associated rolls of such inner roll stand and said central roll stand to control the bending force being applied to the element by said associated rolls,

the operation of the actuating means for each outer roll stand moving such outer roll stand in a horizontal direction relative to the nearest inner roll stand to change the effective lever arm formed between the associated rolls of such outer roll stand and said nearest inner roll stand to control the bending force being applied to the element by such associated rolls,

means rotating at least some of the rolls of the roll stands whereby said rolls impart movement to the element to move the element through the apparatus, and

individual control means operatively connected to each roll stand forming part of the associated actuating means for each such roll stand to control actuation of the associated roll of each such stand, said control means and associated actuating means for each roll stand being operable independently of such means for other roll stands while an element is being straightened and moving through the apparatus in a horizontal direction whereby the operation of the apparatus is continuous while movements of selected roll stands with respect to each other and relative to the element being straightened are occurring.

4,534,198

COOLING HOT-ROLLED STEEL STRIP

Oskar Noé; Andreas Noé, both of Mühlheim, and Rolf Noé, Berlin-Charlottenburg, all of Fed. Rep. of Germany, assignors to BWG Bergwerk - und Walzwerk-Maschinenbau GmbH, Duisburg, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,267

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1982, 3234162

Int. Cl.³ B21B *45/02*

U.S. Cl. 72—201 **7 Claims**

1. In combination with a hot-rolling line having a succession of roll stands through which passes a strip workpiece in a horizontal transport direction, a strip-cooling apparatus comprising:

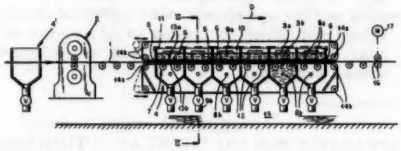
at least one vessel downstream of the roll stands in the direction and aligned in the direction therewith, the vessel being formed with an upstream inlet and a downstream outlet;

a bath of a liquid coolant filling the vessel to a level above the inlet and outlet;

a lower endless belt having an upper stretch extending through the vessel immediately below and engaging the lower surface of said workpiece and supporting same;

an upper endless belt having a lower stretch extending through the vessel immediately above and engagable with the upper surface of the workpiece, said upper and lower endless belts being positioned below the level of the coolant;

means for advancing one of the stretches of at least one of



the belts in the transport direction at the same speed as the workpiece;

means for drawing the workpiece from the roll stands into the inlet, through the vessel between the belt stretches, and out of the outlet thereof, whereby the workpiece is wholly immersed in and cooled by the liquid coolant within the vessel; and

pump means for feeding fresh coolant into the vessel and for withdrawing hot coolant therefrom.

4,534,199

METHOD AND APPARATUS FOR PRODUCED STEPPED TUBES

Kazuhide Takaishi; Toshiki Kadonaga; Masamitsu Tamura; Shigeharu Nakamura; Mitsuru Mizoguchi, all of Shimonoseki; Yoshinobu Hirota, Yamaguchi, and Yukinobu Yamazaki, Shimonoseki, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 14, 1983, Ser. No. 532,070

Claims priority, application Japan, Sep. 16, 1982, 57-163021

Int. Cl.³ B21C *37/20, 37/15, 1/24*

U.S. Cl. 72—276 **6 Claims**

1. A method of producing a tube with a circumferential stepped wall portion from a mother tube with a stepped wall portion on the inner periphery thereof utilizing a die cavity; a split die separable into first and second halves in a longitudinal direction; a plug member extending into said die cavity and a carriage; wherein said method comprises:

preparing a straight mother tube so as to have a stepped wall portion of a smaller inside diameter on the inner periphery thereof at a predetermined position in the longitudinal direction of said tube between first and second opposite straight portions of a larger inside diameter;

inserting said mother tube in a clearance between said split die separable into said first and second halves in a longitudinal direction at a median point of said die cavity and having a first and second bearing portions at opposite ends thereof, respectively, and said plug member extending through said die cavity;

gripping a mouth portion of said mother tube by said carriage while positioning said plug member at said first die bearing portion on a side of said carriage;

moving said carraige in a longitudinal direction of said mother tube until said stepped wall portion on the inner periphery of said mother tube aligns with said die cavity,

thereby expanding and stretching said first straight portion;

moving said plug member up to said second die bearing portion to expand and stretch the inner stepped wall portion into and along said die cavity, thereby forming a reversed stepped wall portion on the outer periphery of said mother tube;

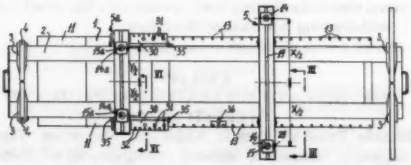
releasing said first and second halves of said split die to permit the first die half located on a side of said carraige to move in a longitudinal direction of said tube; and

moving said carriage again in said longitudinal direction to expand and stretch the second straight portion of said tube, thereby forming a tube with a circumferential stepped wall portion.

4,534,200
APPARATUS FOR MOUNTING AN AUTOMOBILE BODY ON A CHECKING FRAME

Germain Celette, Vienne, France, assignor to Celette S.A., Vienne, France

Filed Apr. 6, 1984, Ser. No. 597,537
Claims priority, application France, Apr. 6, 1983, 83 05578
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—305 **15 Claims**



1. Apparatus for mounting a damaged vehicle body on a checking frame having longitudinal members provided with internally-threaded modular holes, wherein said apparatus comprises in combination:

a first cross-member carried by two vertical end-plates rigidly fixed to two mounting-plates which can be fixed in the holes of the longitudinal members of the checking frame;

two sole-plates to be fixed on said longitudinal members in the longitudinal direction;

a second cross-member also carried by vertical end-plates rigidly fixed to two mounting-plates which can be fixed in adjustable positions on the sole-plates, said sole-plates being provided in the direction of their length with holes having a smaller modular spacing than the holes of the longitudinal members of the checking frame;

four vehicle body supports slidably mounted on said cross-members and capable of receiving detachable positioning elements which are specific to each type of vehicle body;

an arrangement such that the two cross-members are raised to a sufficient height to permit positioning of the horizontal frame of a measuring device beneath said cross-members so that said measuring device can thus rest on the longitudinal members of the checking frame.

4,534,201
UNDERCUT PUNCH TO CONTROL IRONING

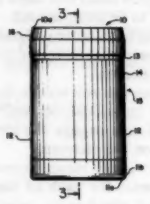
John LaRosa, Carpentersville, Ill., and David C. Panipinto, Ontario, N.Y., assignors to American Can Company, Greenwich, Conn.

Filed Dec. 29, 1982, Ser. No. 454,420
Int. Cl.³ B21D *22/21*
U.S. Cl. 72—348 **11 Claims**

7. A drawing and ironing punch having a hollow inside and circular cross-section with an outside wall adapted to selectively iron as the stroke of said punch forces a thin sheet of material through an ironing die and simultaneously during a part of the punch stroke into contact with an axially aligned bottom profiling tool comprising:

a first diameter of punch cross-section sufficient to produce ironing of said material between said die and said punch during initial punch stroke;

a second diameter of said punch cross-section located axially along in the direction opposite of the initial punch forming stroke and being of an amount such that ironing does not occur,



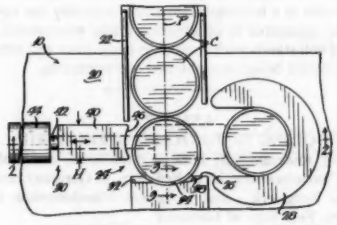
a transition ramp between said first and second diameters being axially located to first remove the ironing load during initial application of bottom profiling, and

a third diameter of punch cross-section substantially the same as said first diameter and located further axially along in the direction opposite punch stroke for resuming ironing of said side wall near the end of the application of bottom profiling.

4,534,202
CUP FEEDING MECHANISM

Walter W. Snyder, Joshua, Tex., assignor to National Can Corporation, Chicago, Ill.

Continuation of Ser. No. 180,325, Aug. 22, 1980, abandoned.
This application Aug. 25, 1983, Ser. No. 518,917
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—349 **10 Claims**



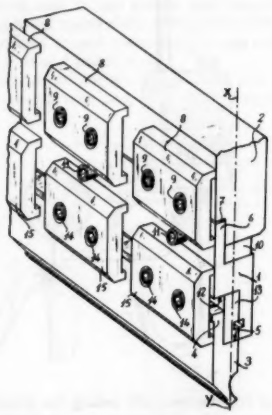
1. A cup feeding machine for feeding cups to a drawing and ironing apparatus including a fixed frame having a reciprocal punch and a yoke having an arcuate opening having a diameter substantially equal to the diameter of the cup, said mechanism comprising a cup feeding means for supplying cups along a path to a stabilizing position, said stabilizing position being defined by a fixed planar surface having a cup receiving recess therein, said recess defining a stabilized position for said cups at the end of said path and having an inclined ramp portion merging with said fixed planar surface for guiding said cups to said yoke, and transfer means adapted to engage said cups while in said stabilizing position and move said cups from said stabilizing position along said inclined ramp portion into a final cup position in said yoke prior to drawing and ironing.

4,534,203

ADAPTER DEVICE FOR MOUNTING PUNCHES ON A BENDING PRESS

Pierre Cros, Vaucresson, France, assignor to Promecam Sisson-Lehmann, Saint Denis, France

Filed Jan. 24, 1984, Ser. No. 573,501
Claims priority, application France, Feb. 15, 1983, 83 02386
Int. Cl.³ B21D *37/04*
U.S. Cl. 72—481 **4 Claims**



1. An adapter for mounting punches having attachment heels on the top die-shoe of a bending press, wherein said adapter is constituted by the following combination:

a body in the form of bar means which can be attached to the top die-shoe of the corresponding press and the bottom portion of which is provided on one of its vertical faces with a recess of greater depth in a horizontal direction than an attachment heel of a punch, irrespective to the type of said heel;

a bearing spacer having the same height as the recess of the adapter body and capable of being placed against either vertical side of the heel of the punch to be fixed in position in the recess;

said spacer and the heel of the corresponding punch being fixed in position in the recess by cramps which are held by screws against the adapter body and are located on the same side in a horizontal direction as the opening of the recess provided in said body;

said screws passing through said spacer, and said spacer being slidable on the screws in a direction lengthwise of the screws until the screws are tightened to fix the spacer in position.

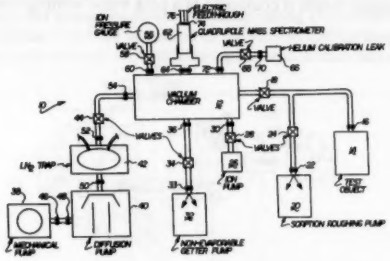
4,534,204

CALIBRATION METHOD FOR ULTRA SENSITIVE NOBLE GAS LEAK DETECTOR

Lyle E. Bergquist, Lakewood, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Division of Ser. No. 499,825, Jun. 1, 1983, Pat. No. 4,492,110.
This application Jul. 30, 1984, Ser. No. 635,633
Int. Cl.³ G01M *3/00*; B01D *59/44*
U.S. Cl. 73—1 G **2 Claims**

1. In a process of calibrating an ultrasensitive noble gas leak detector having a vacuum chamber and a gas detector, the improvement comprising providing as a calibrating source an americium 241 alpha source, accumulating helium molecules from the americium source in an enclosed volume for a specified period of time, permitting said helium molecules to enter



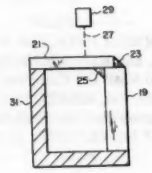
said vacuum chamber, and obtaining a gas detection measurement to calibrate the detector for the sensitivity of the system.

4,534,205

METHOD OF SHOCK TESTING ALUMINUM ALLOY WELDED JOINTS

René J. Van Caneghem, Elkton, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 15, 1984, Ser. No. 620,789
Int. Cl.³ G01N *3/30*
U.S. Cl. 73—12 **5 Claims**



1. A method of shock testing the welded joints of aluminum alloy armor plate wherein the components of said welded joints may be of diverse thickness and different alloys, comprising the steps of; determining with a standard plate proofing projectile at 0 degrees obliquity the critical velocity of each of said diverse thicknesses of said armor plates of each of said different alloys, said critical velocity being defined as that velocity below which either no cracks or cracks less than 12 inches long can be expected and above which longer cracks or catastrophic failure can be expected, then testing said welded joints by separately impacting each of the said components joined by said joint in the vicinity of said joint with the said standard plate proofing projectile at 0 degree obliquity at a striking velocity less than said critical velocity.

4,534,206

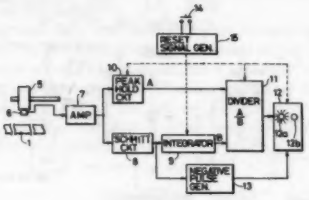
STRIKE DIAGNOSIS APPARATUS

Mataichiro Kiso; Akemi Futakawa, and Tokio Fukunaga, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

PCT No. PCT/JP82/00133, § 371 Date Dec. 7, 1982, § 102(e) Date Dec. 7, 1982, PCT Pub. No. WO82/03686, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 20, 1982, Ser. No. 451,201
Claims priority, application Japan, Apr. 20, 1981, 56-60743; Feb. 13, 1982, 57-23102
Int. Cl.³ G01N *3/30*
U.S. Cl. 73—12 **12 Claims**

1. A strike diagnosis apparatus comprising means for detecting a striking force produced by a strike applied to an object to

be striked and for generating a strike signal representing said striking force, and means for judging the good or bad condition of said object on the basis of the strike signal, wherein said judging means is composed of a peak value holding circuit for



holding a peak value of said strike signal, signal width detecting means for detecting a signal width of said strike signal in the axis of time, and a divider for obtaining the ratio of said peak value and said signal width.

4,534,207

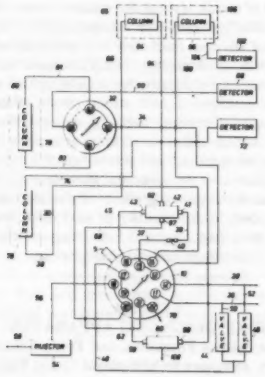
REFORMER PROCESS ANALYZER

Julius J. Szakasits, and Robert E. Robinson, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 499,122, May 31, 1983, abandoned. This application Jan. 15, 1985, Ser. No. 691,727

Int. Cl.³ G01N *31/08*

U.S. Cl. 73—23.1 **30 Claims**



1. A method for analyzing a hydrocarbon sample for paraffins, naphthenes and aromatics, comprising:

separating said aromatics of said sample from said paraffins and naphthenes of said sample;

separating and detecting said paraffins and naphthenes by carbon number;

separating and detecting individual saturated components of said sample; and

separating and detecting individual components of said aromatics.

4,534,208

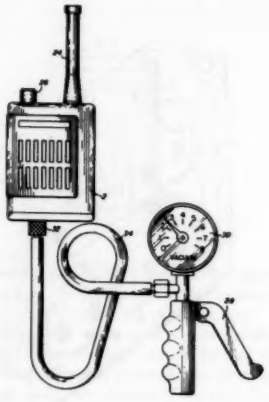
METHOD AND APPARATUS FOR TESTING A SEALED CONTAINER

Bruce J. Macin, Lauderhill, and Mark S. Bresin, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 9, 1983, Ser. No. 550,265

Int. Cl.³ G01M *3/26*

U.S. Cl. 73—49.3 **9 Claims**



1. A method of non-destructively testing the integrity of an entire sealed container having a test port including a fixed sealed membrane which is pervious to gas and impervious to liquid, comprising the steps of:

non-destructively creating a pressure differential between the gas on the container side of said fixed membrane and the gas on the other side of said fixed membrane;

monitoring the rate of pressure equalization to determine the integrity of said fixed membrane;

allowing said pressure differential to equalize through said fixed membrane;

monitoring said equalized pressure to detect whether or not said equalized pressure changes.

4,534,209

ATMOSPHERIC CONSISTOMETER

Howard E. Sanders, 49 S. 85th East Ave., Tulsa, Okla. 74112

Filed Sep. 15, 1983, Ser. No. 532,363

Int. Cl.³ G01N *11/14*

U.S. Cl. 73—59 **3 Claims**

1. An apparatus for measuring the consistency of cement slurries comprising:

a liquid containing vessel having a bottom, a top and sidewalls, the bottom and top having openings therein;

a vertical shaft extending sealably through said container bottom opening;

a flange affixed to the upper end of said shaft within said vessel and a sheave affixed to the lower end of said shaft exteriorly of said vessel;

a motor mounted exteriorly of said vessel having a shaft extending therefrom, a sheave on the motor shaft and a belt between the sheaves whereby the motor rotates said flange;

a slurry cup positionable within said container through said top opening therein, the slurry cup having a cylindrical sidewall, a bottom and an open top and including a pivot bearing recess in the cup interior bottom in alignment with the cup cylindrical axis;

means engageable between the exterior of said cup bottom and said flange for removeably coupling the two whereby the cup is rotated coaxially with said shaft;

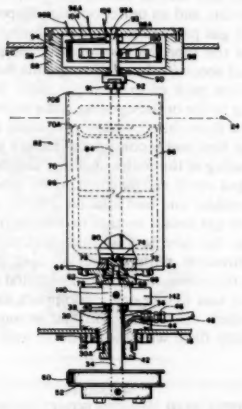
a paddle removeably insertable within said cup, the paddle

having an elongated vertical central paddle shaft portion and having a vertical blade portion in proximity to the cup interior cylindrical wall and having, on the lower end thereof, a downwardly extending conical bearing receivable in said cup pivot bearing recess, the paddle shaft and conical bearing being coaxial with said cup cylindrical axis;

a potentiometer cup removeably supported within said opening in said vessel top and having an opening in the bottom thereof receiving said paddle shaft;

a coiled spring received in said potentiometer cup in a plane perpendicular to said paddle shaft longitudinal axis, the spring being coiled about said paddle shaft and having one end affixed to said potentiometer cup and the other end affixed to said paddle shaft;

a circular potentiometer element received in said potentiometer coaxial with and in a plane perpendicular to said



paddle axis, the diameter of the potentiometer element being greater than said spring and less than said cup and having two electrical lead connections;

an electrically conductive wiper arm extending from said paddle shaft and slideably engaging said potentiometer element, the wiper arm having an electrical lead connection;

electrical heating means within said vessel, the vessel having liquid therein, the level of the liquid being below the top of said cup; and

voltmeter means electrically connected with said potentiometer and wiper arm leads and a voltage source for indicating the position of said wiper arm which is responsive to the rotation of said paddle against the resilient restriction of said spring as said cup is rotated when said cup has a cement slurry therein, the rotational displacement of said paddle axis being indicative of the consistency of the cement slurry in said cup.

4,534,210

APPARATUS AND METHOD FOR MEASURING THE VISCOSITY OF A LIQUID

Timothy J. Reeves, 5 Rosdin Lodge, Prince's Ave., Windsor, Randburg, Transvaal, South Africa

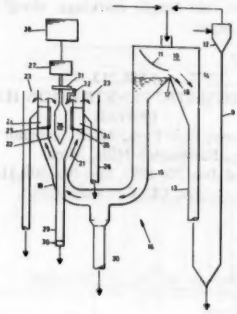
Filed Oct. 11, 1983, Ser. No. 540,813

Claims priority, application South Africa, Oct. 11, 1982, 82/7413

Int. Cl.[3] **G01N** *11/14*

U.S. Cl. 73—59 **15 Claims**

1. An apparatus for the continuous measurement of the vicosity of a liquid flowing in a circuit, the apparatus, including means for continuously drawing off part of the flow of the liquid in the circuit, means for establishing a substantially constant static head in the liquid drawn off, means for allowing at least some of this liquid to flow at a constant flow rate under gravity past a rotor arranged to be rotated by a motor so that the liquid exerts a drag on the rotor in accordance with its viscosity and means for measuring an operating characteristic of the motor to give an indication of the viscosity of the liquid, and wherein the means for establishing a constant static head in



the liquid drawn off includes a static head chamber provided with an overflow weir at a predetermined height above the rotor, the weir being situated at the head of a downwardly extending limb of a U-shaped chamber, the other limb of which extends upwardly to a level lower than that of the weir, so that liquid flowing under gravity through the chamber can overflow at the top of the other limb.

4,534,211

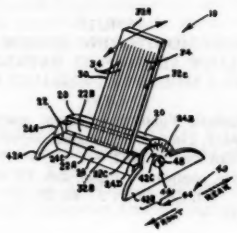
TESTING APPARATUS FOR QUANTITATIVELY MEASURING CREEPABILITY OF LIQUIDS

Orlando G. Molina, 15631 Astor St., Westminster, Calif. 92683

Filed Sep. 2, 1983, Ser. No. 529,179

Int. Cl.[3] **G01N** *13/02*

U.S. Cl. 73—64.4 **26 Claims**



1. A testing apparatus for quantitatively measuring the creepability property of a liquid, comprising:

a. a base member having a longitudinal indentation therein essentially in the shape of a "V" with a depression at the vertex of said "V";

b. a test panel member made of liquid impervious material and having a top end, a bottom end, and a face therebetween, wherein this member has a plurality of adjacent straight grooves in said face positioned in parallel-spaced relationship to each other and running from said bottom end towards said top end with markings therealong indicating the length of said grooves from said bottom end, and wherein this member is disposed face-front and with said bottom end thereof positioned in said depression of said base member, whereby said test panel member is

disposed in an essentially vertical positional relationship with reference to said base member; and

c. means, operably associated with said base member, for selectively rotating said base member and thereby inclining said test panel member rearwardly;

whereby when a liquid is placed in said base member indentation, said liquid creeps up said grooves in said test panel member, and thereby said creepability property of said liquid can be determined from said length markings, along said grooves, reached by said liquid.

4,534,212

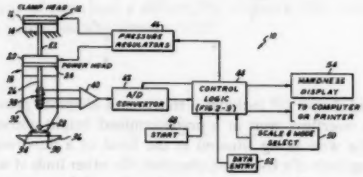
FULLY AUTOMATIC PENETRATION HARDNESS TESTER

Thomas C. Targosz, Oak Park, Mich., assignor to K. J. Law Engineers, Inc., Farmington Hills, Mich.

Filed Jun. 30, 1983, Ser. No. 509,318

Int. Cl.³ G01N *3/44*

U.S. Cl. 73—83 **17 Claims**



1. An automatic penetration hardness tester comprising a penetrator adapted to engage test specimens, means for applying a plurality of loads in a predetermined sequence to a test specimen through said penetrator so as to cause varying penetration depth of said penetrator into the test specimen, means responsive to motion of said penetrator with respect to the test specimen for automatically initiating application of the next load in said sequence when motion of said penetrator following application of the preceding load in said sequence has terminated, and means responsive to depth of penetration under said plurality of loads for indicating specimen hardness.

4,534,213

EXHAUST MONITORING SENSOR FOR A CLOSED-LOOP AIR-TO-FUEL RATIO CONTROL SYSTEM OF A MULTIPLEX EXHAUST MANIFOLD ENGINE

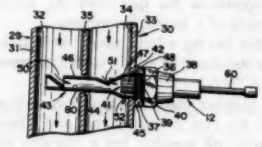
Tatsumi Mirikidani, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 6, 1982, Ser. No. 447,252

Claims priority, application Japan, Jan. 12, 1982, 57-2486

Int. Cl.³ G01N *27/46, 25/02*

U.S. Cl. 73—118 **11 Claims**



11. An exhaust monitoring system for an engine having an exhaust system including first and second exhaust gas passages for passing exhaust gases from said engine, a wall portion of said first exhaust gas passage coinciding with a wall portion of said second exhaust passage to form a partition wall separating said first and second exhaust passages, said partition wall having a hole extending threrethrough, the exhaust monitoring system comprising:

an at least partially threaded hole extending through a wall portion of said second exhaust passage and having an annular shoulder adjacent thereto;

an attaching body secured to said wall portion and having a threaded periphery engagable with said at least partially threaded hole;

an exhaust gas sampling tube extending between said first and second exhaust gas passages generally perpendicular to axes of said first and and exhaust passages through said hole and said at least partially threaded hole, said tube having a first inlet opening disposed in said first exhaust gas passage to sample exhaust gas flowing therein, a second inlet opening disposed in said second exhaust gas passage and formed through a wall of said tube on the upstream side of said tube with respect to exhaust gas flow through said second passage to sample exhaust gas flowing therein, and an outlet opening disposed in said second exhaust gas passage and formed through the downstream wall of the tube for venting said sampled exhaust gases into said second exhaust passage, the sampling tube defining a first path of exhaust gas flow from the first inlet opening to the outlet opening and a second path of exhaust gas flow from the second inlet opening to the outlet opening, the first and second paths having a common portion terminating at the outlet opening, said tube further having a flanged open end adapted to be sandwiched between said shoulder and said attaching body; and

an exhaust gas sensor section extending from said attaching body to the tube beyond said third outlet opening in an axial direction with respect to said tube at a location within the common portion of the first and second paths, wherein said first opening comprises an open end of said tube which opens into said first passage, said end being essentially flush with the partition wall.

4,534,214

SYSTEM FOR DIAGNOSING AN INTERNAL COMBUSTION ENGINE

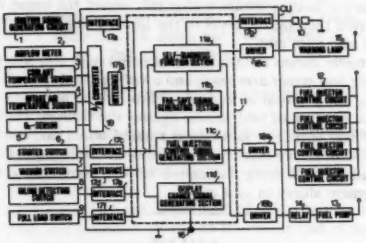
Toshio Takahashi, Mitakashi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,507

Claims priority, application Japan, Oct. 1, 1982, 57-173623

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—118 **2 Claims**



1. In a system for diagnosing an internal combustion engine having a coolant temperature sensor, the improvement comprising

a coolant temperature diagnosing circuit responsive to output voltage of said coolant temperature sensor for producing an output when said output voltage exceeds a predetermined range;

means for generating an output voltage dependent on engine speed;

a fail-safe signal generating circuit responsive to said output voltage of said means for producing one of fail-safe signals in dependency on said output voltage of said means; and

switch means responsive to said output of said coolant temperature diagnosing circuit for allowing said fail-safe signal to pass.

4,534,215

TAPE TENSION MEASURING DEVICE

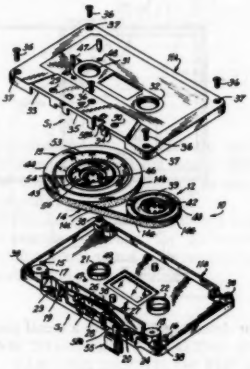
Yuzo Yamano, Kanagawa, and Hikaru Oozeki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 27, 1978, Ser. No. 900,609

Claims priority, application Japan, Apr. 28, 1977, 52-55266[U]; Apr. 28, 1977, 52-55267[U]

Int. Cl.[2] G01L *5/06, 3/18*

U.S. Cl. 73—862.44 **22 Claims**



1. A tape-tension measuring device interchangeable with a tape cassette in a cassette-type magnetic tape recording and/or reproducing apparatus which has selectively rotated supply and take-up reel shafts adapted to extend through respective apertures of a cassette housing for engagement with tape supply and take-up reels within the latter, and a tape drive capstan and pinch roller and additional operating members adapted to extend through respective openings of the cassette housing for engagement with a tape in the latter at spaced apart locations along one side of the cassette housing during recording and reproducing operations of the apparatus: said tape-tension measuring device comprising a casing substantially equivalent to the cassette housing to be interchanged therewith and having openings at locations along one side of the casing in correspondence to said openings of the cassette housing; first and second reel assemblies in said casing, means in said first reel assembly for rotatably coupling the latter with the take-up reel shaft, said second reel assembly including an inner ring portion fixed relative to said casing and having a hub for receiving the supply reel shaft, an outer ring portion rotatable relative to said inner ring portion and spring means yieldably resisting turning of said outer ring portion relative to said inner ring portion; a test tape having portions wound on said first reel assembly and said outer ring portion of the second reel assembly and an intermediate tape run therebetween for causing said outer ring portion to turn relative to said inner ring portion through an angle dependent on the tension in said tape run; means for indicating tape tension as a function of said angle of relative turning; and guide means guiding said tape run along a path which extends along only a portion of said one side of the casing at which the openings for the tape drive capstan and pinch roller are located, so that the additional operating members of the recording and/or reproducing apparatus remain free of said test tape in the casing to avoid influencing the tension in said tape run.

4,534,216

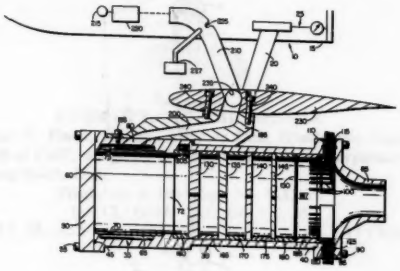
METHOD AND APPARATUS FOR DETERMINING THE ACCURACY OF WIND TUNNEL TEST DATA

Anthony Fasano, Glastonbury; John H. Roberts, Bolton, and David L. Motycka, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 31, 1983, Ser. No. 499,700

Int. Cl.[3] G01M *9/00;* **G01L** *5/13*

U.S. Cl. 73—147 **12 Claims**



1. A reference model for the wind tunnel testing of a combustorless gas turbine engine simulator, said reference model being characterized by:

a housing having upstream and downstream end portions, said housing being adapted for the accommodation therethrough of a flow of pressurized air;

means disposed interiorly of said housing for maintaining the pressure and flow rate of said airflow at levels corresponding to those associated with the operation of said combustorless gas turbine engine simulator in the aerodynamic testing thereof; and

an exhaust nozzle of standard geometry disposed at the downstream end portion of said housing;

whereby the accuracy of performance measurements associated with said aerodynamic testing of said combustorless gas turbine engine model is determinable by a comparison of the performance of said reference model determined analytically, with the performance of said reference model determined empirically from the characteristics of said airflow through said reference model and the geometry of said exhaust nozzle.

4,534,217

MEASURING THE DRAFT OF A VESSEL

Frans Caus, Zeebrugee, Belgium, assignor to Tate & Lyle Public Limited Company, England

Filed Jan. 5, 1984, Ser. No. 568,402

Claims priority, application United Kingdom, Jan. 7, 1983, 8300332

Int. Cl.[3] G01C *21/00*

U.S. Cl. 73—178 R **11 Claims**

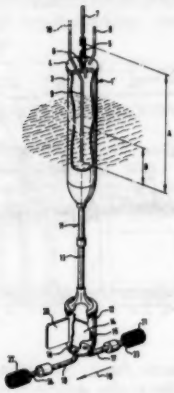
1. Apparatus for measuring the draft of a vessel, comprising:

a closed damping chamber for being placed in the water in which the vessel is floating and for containing water having a free water surface inside the damping chamber, the free water surface having a level corresponding, in still conditions, to the level of the water in which the vessel is floating;

a gas duct for connecting to a manometer and having an exit opening below water level in communication with the damping chamber whereby gas can be passed through the gas duct to issue from the gas duct exit opening and the pressure of the gas in the gas duct is representative of the water pressure at the duct exit opening;

a vent for venting gas from the upper part of the damping chamber; and

a water duct for providing a connection between the damping chamber and the water in which the damping chamber is placed, the water duct having an effective cross-sectional area which is much less than the horizontal cross-sectional area of the damping chamber, the water duct being for admitting water to the damping chamber so that



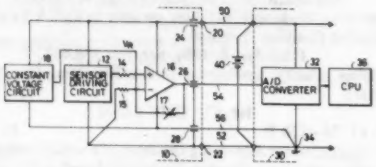
the level of the free water surface is above the gas duct exit opening, wherein said water duct includes an admission chamber having a water inlet and a water outlet for opening into said surrounding water, the effective cross-sectional areas of said water inlet and of said water outlet to said admission chamber being equal and much smaller than the flow cross-section in said admission chamber.

4,534,218

THERMAL FLOW METER

Sadayasu Ueno, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 523,858
Claims priority, application Japan, Aug. 23, 1982, 57-144738
Int. Cl.³ G01F 1/68
U.S. Cl. 73—204 **5 Claims**



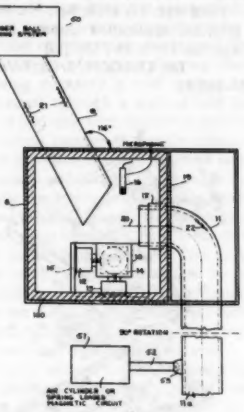
1. A thermal flow meter comprising: sensor means including a thermosensitive element and an amplifier for amplifying a current flowing through said thermosensitive element; signal processing means including an A/D converter for converting the signal form said amplifier to a digital signal, and a digital calculation means; a power source; a signal line for applying a current from said power source to said thermosensitive element and said amplifier; a return line for returning the current from said thermosensitive element to said power source; and a ground potential line for said amplifier; said ground potential line being separate from said return line and being grounded within said signal processing means.

4,534,219

ACOUSTIC DETECTION OF CRACKS IN METAL PIECES

Francois Nadeau, 822 Yvonne Duckett St., St-Bruno, Quebec, Canada (J3V 4P6); Jean F. Bussiere, 155 Ave. Lakeview, St-Bruno, Quebec, Canada (J3V 2L6), and Ghislain Vaudreuil, 437 Brion, Boucherville, Quebec, Canada J4B 6B2

Filed Nov. 17, 1983, Ser. No. 552,973
Int. Cl.³ G01N 29/04
U.S. Cl. 73—587 **24 Claims**



1. A device for detecting a crack in a metal piece comprising:

anvil means;

means for producing an impact between the metal piece and the anvil means, said impact generating an acoustic wave formed of a plurality of components, one of said components being produced by vibrations of said metal piece and having a frequency indicating a cracked or uncracked state of the metal piece;

means for sensing and measuring the energy of said one component of said generated acoustic wave within a predetermined time gate and within a predetermined frequency bandwidth; and

means for determining if said metal piece is cracked or uncracked in accordance with said measured energy;

said anvil means being designed so that its vibrations generated by the impact produce no acoustic wave component at a frequency located within said predetermined frequency bandwidth in order to prevent influence on said energy measurement of any component of said generated acoustic wave produced by the anvil means.

4,534,220

APPARATUS FOR MEASURING THE CHARACTERISTICS OF AN ULTRASONIC WAVE MEDIUM

John R. Kleeper, 3238 Twenty Third Ave. W., Seattle, Wash. 98199; John M. Reid, 722 Upper Gulph Rd., Strafford, Pa. 19087; Hirohide Miwa, 6-7-10, Miyazaki, Miyamae-ku, Kawasaki-shi, Kanagawa 213, Japan; Takaki Shimura, 29-44, Tsurukawa 4-chome, Machida-shi, Tokyo 194-01, Japan, and Keiichi Murakami, 17-305-2-8-6, Teraodai, Tama-ku, Kawasaki-shi, Kanagawa 214, Japan

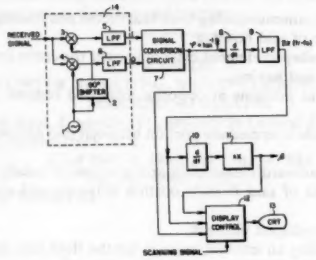
Filed Jan. 27, 1984, Ser. No. 574,690
Int. Cl.³ G01N 29/00
U.S. Cl. 73—599 **17 Claims**

1. An apparatus for measuring ultrasonic wave attenuation and phase by sending an ultrasonic wave pulse toward an object to be measured, and receiving, as a received signal,

waves reflected from different depths within the object to be measured, comprising:

means for supplying a reference signal;

means, operatively connected to said reference signal supplying means and operatively connected to receive the received signal, for determining a phase difference between the received signal and the reference signal;



first differentiating means, operatively connected to said phase difference determining means, for differentiating the phase difference with respect to time to generate a frequency shift amount signal; and

second differentiating means, operatively connected to said first differentiating means, for differentiating the frequency shift amount signal with respect to time to generate an attenuation slope coefficient.

4,534,221

ULTRASONIC DIAGNOSTIC IMAGING SYSTEMS FOR VARYING DEPTHS OF FIELD

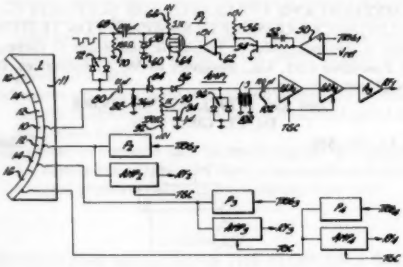
Michael J. Fife, Denver; Paul T. Diaz, Englewood, and Dennis R. Dietz, Littleton, all of Colo., assignors to Technicare Corporation, Solon, Ohio

Filed Dec. 20, 1982, Ser. No. 451,313

Claims priority, application United Kingdom, Sep. 27, 1982, 8227532

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—626 **13 Claims**



9. In an ultrasonic diagnostic imaging system, including a multi-element transducer for transmitting ultrasonic energy into tissue to be imaged and for receiving echoes from said tissue; apparatus comprising:

a plurality of transducer pulsers, each having an output coupled to a respective element of said transducer for exciting said elements, and having respective inputs;

means for selecting a given depth of focus within said tissue to be imaged from a range of focal depths by controlling the time sequence of pulsing of the respective elements; and

means, responsive to said selecting means, for activating said pulsers to produce broad band ultrasonic energy transmission by said transducer elements when one depth of focus is selected, and to produce narrow band ultrasonic energy transmission by said transducer elements when a different depth of focus is selected.

4,534,222

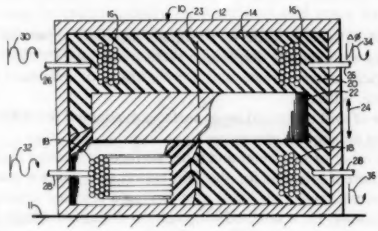
FIBER-OPTIC SEISMIC SENSOR

George W. Finch, Malibu, and Eric Udd, Huntington Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 8, 1983, Ser. No. 521,001

Int. Cl.³ G01H *1/00*; G01V *1/16*

U.S. Cl. 73—653 **17 Claims**



1. A vibration sensor including:

a first optical fiber having:

an input end;

an output end; and

a coil portion therebetween of a first predetermined optical path length when said sensor is not subject to vibration to be sensed;

a second optical fiber having:

an input end;

an output end; and

a coil portion therebetween of a second predetermined optical path length when said sensor is not subject to vibration to be sensed;

a closed body adapted to be coupled to the vibration to be sensed to vibrate said body, said coil portions of said first and second optical fibers being positioned within said body; and

means to vary said optical path length of at least said first optical fiber coil portion with the vibration of said body including:

a mass having:

a first side; and

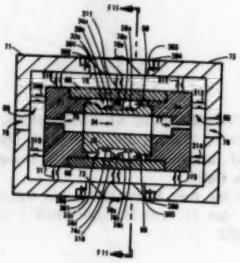
a second opposite side, said first and second sides being orientated generally at right angles to the vibration to be sensed; and

elastic means to fill said body and encapsulate said coil portions of said first and second optical fibers and said mass within said body, said mass being positioned between said coil portion of said first optical fiber and said coil portion of said second optical fiber, whereby movement of said mass within said body caused by vibration of said body causes said elastic means to exert differential pressures between said coil portions of said first and second optical fibers.

4,534,223
SURFACE ACOUSTIC WAVE SENSORS

Bikash K. Sinha, West Redding, and Michel Goulloud, Norwalk, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 427,240, Sep. 29, 1982,. This application Aug. 1, 1984, Ser. No. 636,872
Int. Cl.³ G01L 11/00
U.S. Cl. 73—703 38 Claims



1. A surface acoustic wave signal frequency apparatus comprising a crystalline diaphragm section having a cylindrical or spherical outer surface and a cylindrical or spherical inner surface, wherein:

one of said outer and inner surfaces is adapted for subjection to an applied pressure;

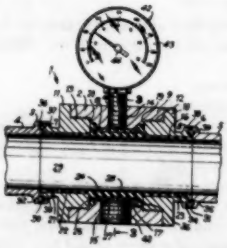
the other of said outer and inner surfaces includes a first area thereof adapted for the fabrication of a surface acoustic wave device, said first area having a selected orientation having, for a selected propagation direction, a high sensitivity to pressure effects, a low sensitivity to temperature effects, and a first turnover temperature; and

said other surface further includes a second area thereof adapted for the fabrication of a surface acoustic wave device, said second area having a selected orientation having, for a selected propagation direction, a high sensitivity to pressure effects, a low sensitivity to temperature effects, and a second turnover temperature different than said first turnover temperature.

4,534,224
ISOLATION FLUID PRESSURE DETECTOR

Spiros G. Raftis, Pittsburgh, Pa., assignor to Red Valve Company, Inc., Carnegie, Pa.

Filed May 17, 1984, Ser. No. 611,333
Int. Cl.³ G01L 7/08
U.S. Cl. 73—730 7 Claims



1. An arrangement for detecting the pressure of a fluid, comprising:

(A) a housing having a central part and two end parts separate from said central part and connected thereto in a disassembleable manner, said parts having

(i) an internal surface which bounds an elongated bore centered on a longitudinal axis,

(ii) a recess extending substantially radially with respect to said longitudinal axis outwardly beyond said bore over only a part of the elongation of the latter and extending circumferentially around the entire periphery of said bore, and

(iii) a port communicating with said recess and leading to the exterior of said housing;

(B) a sleeve-shaped element extending over the entire length of said bore and having

(i) two end portions at opposite axial end regions of said bore,

(ii) a flexible intermediate portion between said end portions, and

(iii) two outwardly-extending arm portions at axially opposite sides of said flexible portion between said end portions,

said sleeve-shaped element

(iv) bounding an internal passage for the fluid and impervious thereto, and

(v) so received in said bore that said arm portions are located at opposite axial sides of, and said intermediate portion spans, said recess,

(a) said arm portions being confined between, and sealingly contacting, said central part and a respective one of said end parts,

(b) said arm portions having axially-extending lips extending toward each other and into retaining recesses in said central part so as to seal said recess from said passage;

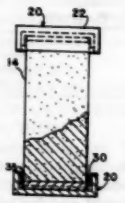
(C) a pressure gauge having a closing portion that sealingly closes said port, and a pressure-detecting mechanism that is in communication through said closing portion with said recess; and

(D) a quantity of pressure-transmitting fluid filling said recess and said pressure gauge to transmit to said pressure-detecting mechanism the pressure of the fluid present in said passage as applied to said pressure-transmitted fluid through said flexible intermediate portion of said sleeve-shaped element with attendant flexing thereof.

4,534,225
METHOD AND APPARATUS FOR SUPPORTING CYLINDRICAL CONCRETE SAMPLES FOR TESTING

Bobbie D. Peacock; John N. Mushovic, and Roger D. Geyer, all of Peachtree City, Ga., assignors to M. A. Industries, Inc., Peachtree City, Ga.

Filed Aug. 1, 1983, Ser. No. 519,068
Int. Cl.³ G01N 3/02
U.S. Cl. 73—860 17 Claims



1. In a flexible elastomeric pad for insertion in respective cavities of each of the opposed caps which are fitted at opposite ends of a concrete test sample, comprising:

a pad bottom surrounded by a peripheral side wall extending upwardly therefrom defining an open cavity in said pad for receiving one end of the concrete sample therein, the top of the pad bottom which receives the concrete flat end thereagainst being recessed and below the upper edge of the outer side wall whereby the side wall extends around

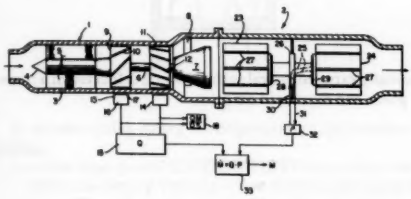
the end of the concrete sample, said overall width and dimension of said pad being such that the pad is tightly fitted into the cavity of the cap so that the outside of the side wall is in contact with the inside of the cap, a recessed top on the bottom of said pad whereby the top of the bottom is below the side wall, said bottom being spaced from said side wall defining a depression between said side wall and said bottom, the pad bottom and end of the cylinder being about the same size but the inside of the cap being larger than the pad bottom.

4,534,226

COUNTER ROTATING, MULTI TURBINE FLOW MEASURING SYSTEM

Leonard Rose, Granville, Vt., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1983, Ser. No. 547,816
Int. Cl.³ G01F *1/12, 1/90*
U.S. Cl. 73—861.84 **6 Claims**



1. A volumetric flow measuring device comprising:
(a) housing means providing a flow path for a fluid,
(b) two axially displaced turbine means mounted in said housing and rotating at different but fixedly related speeds proportional to the velocity of the fluid, said turbines rotating in opposite directions whereby any non-axial flow components of said stream has opposite effects on the speed of rotation of said counter-rotating turbines, each of said turbines having a plurality of helical vanes with the helical twist of the vanes on the two turbines being of an opposite sense to cause them to rotate in opposite directions under the impact of said fluid, the helix angle with respect to the flow axis of the vanes of one turbine differing from the helix angle of the vanes on the other turbine whereby the rotational speed of one turbine is different from the rotational speed of the other turbine for any given flow rate,
(c) means associated with each of said turbines to produce an electrical signal proportional to the rotational speed of the individual turbines,
(d) means to combine said electrical signals to compensate for effects due to non-axial flow components and produce a signal proportional to the volumetric flow rate.

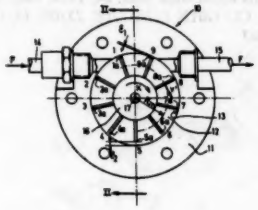
4,534,227

DEVICE FOR MEASURING THE FLOW OF A FLUID

Roland Petit, Dreux, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Nov. 18, 1983, Ser. No. 553,353
Claims priority, application France, Nov. 26, 1982, 82 19839
Int. Cl.³ G01F *1/06, 11/02*
U.S. Cl. 73—861.87 **7 Claims**

1. A device for measuring the flow of a fluid comprising a sealed housing, a rotor having radial vanes equally spaced apart mounted in said housing to rotate freely about an axis of rotation, a fluid supply nozzle and a fluid discharge nozzle for the housing, said nozzles being in alignment with each other and disposed tangentially of the rotor so that a stream of fluid issuing from said supply nozzle encounters said vanes in a direction perpendicular to said axis of rotation, said housing defining two lateral chambers on opposite sides of said rotor, said rotor having two lateral flanges on opposite sides of said vanes and connected to said vanes, said vanes and said flanges being radially internally connected to a central member of the rotor, said vanes, said flanges, said central member and said housing defining, apart from a clearance between said flanges



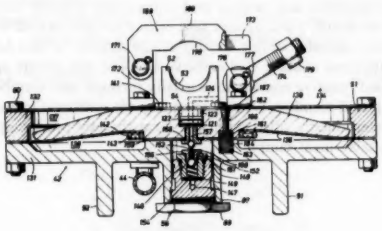
and said housing for permitting rotation of said rotor, a series of compartments which communicate through said clearance with said two lateral chambers, each said compartment being bounded laterally by said flanges and a pair of adjacent vanes and being bounded radially outwardly of said rotor by said housing, said supply nozzle and said discharge nozzle opening at all times into different said compartments.

4,534,228

WIRELINE TENSION GAGE

Edward W. Burbank, Jr., 9604 Briar Forest, Houston, Tex. 77063

Filed Jan. 31, 1983, Ser. No. 462,608
Int. Cl.³ G01L *5/08*
U.S. Cl. 73—862.45 **22 Claims**



1. A tension gage for mounting on a wireline between its load and anchor ends comprising:
(a) an elongated body;
(b) a post for transmitting forces mounted in said body and at one end carrying a saddle to support the wireline;
(c) a transmitter acted upon by said post for producing a signal responsive to wireline forces acting on said post and means for calibrating said signal;
(d) roller assemblies mounted at opposite sides of said post on said body and aligned with the wireline resting in said saddle;
(e) each of said roller assemblies comprising an upstanding bridge secured at one end to said body and on a shaft rotatably mounting a sheave for engaging the wireline;
(f) each said shaft journaled to said bridge by an eccentric pivot whereby in a first position said sheave thereon is lifted from the wireline and in a second position said sheave engages the wireline to displace same a certain lateral distance; and
(g) locking means for holding each said eccentric pivot in the second position whereby said gage is secured to the wireline for measurement of the tension conditions upon the wireline.

4,534,229

METHOD AND APPARATUS FOR PREPARING A MEAT SAMPLE FOR DETERMINATION OF COMPOSITION OF SAME

David B. Funk, Auburn, and James B. Kallmeyer, Glenarm, both of Ill., assignors to Dickey-john Corporation, Auburn, Ill.

Continuation-in-part of Ser. No. 375,552, May 6, 1982, Pat. No. 4,496,907. This application Mar. 24, 1983, Ser. No. 478,254

Int. Cl.[3] G01N *1/28, 1/08, 25/00, 33/12*

U.S. Cl. 73—863 22 Claims

1. A method for preparing an analyzable meat sample for compositional analysis comprising: (1) obtaining a predetermined quantity of ground meat, said meat having a predetermined particle size; (2) forming said meat into a layer having a predetermined thickness; (3) isolating a first portion of said layer from the remainder; (4) urging said first portion into an elongate hollow member having an axis, an open end, and a resistive end movable along said axis relative to said open end; (5) urging said first portion and said resistive end together so as to produce a substantially air void-free isolate out of said first portion; (6) isolating a subsequent portion of said layer from the remainder and urging said subsequent portion into said hollow member and against said isolate already in said hollow member thereby adding to said isolate already in said hollow member and causing said resistive end and said isolate engaging said resistive end to move axially through said member for filling said member; (7) repeating step (6) until said member is predeterminedly filled with said meat thereby producing said analyzable meat sample.

4,534,230

INDIVIDUAL PORTABLE DUST COLLECTOR

Paul Courbon, Apremont, France, assignor to Charbonnages de France, Paris, France

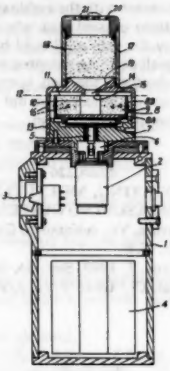
Filed Aug. 1, 1983, Ser. No. 519,244

Claims priority, application France, Aug. 3, 1982, 82 13541

Int. Cl.[3] G01N *1/24*

U.S. Cl. 73—863.23 10 Claims

1. A portable dust collector comprising a rotatable cup having a bottom and a side wall extending from said bottom, a ring of filter foam accommodated in said cup said ring having a central channel, a cover surrounding said cup, said cover having a central air inlet and a lateral air outlet, and a cowl supported on said cover, said cowl having an air passage which caps the central air inlet of the cover, wherein the cowl is filled with at least one prefiltration block and has a duct arranged after said block in the direction of air flow and connected to said central air inlet of the cover, said inlet ending at an outlet orifice which has a smaller diameter than that of the central channel of the filter foam ring, the inlet being coaxial with said channel, and wherein the thickness of the foam ring is equal to the height of the side wall of the cup, the foam ring having a



substantially exposed lateral surface which is located in a transverse plane and faces said air inlet.

4,534,231

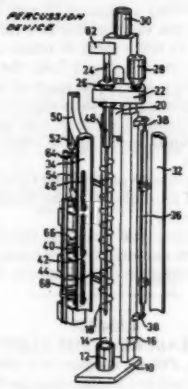
METHOD AND DEVICE FOR TAKING SOIL SAMPLES

Mats Jonsson, and Per-Olof Edén, both of PL 1425, Bergeforsen, Sweden (860 33)

Filed Jun. 21, 1983, Ser. No. 506,372

Int. Cl.[3] G01N *1/06;* E21B *49/02*

U.S. Cl. 73—864.43 12 Claims

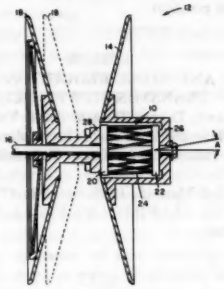


1. A process of taking soil samples which are to be analyzed wherein a core sample is extracted from the ground and the soil sample removed from the core sample, the process comprising taking a core sample using an auger-type drill by drilling to a predetermined depth, stopping rotation of the drill, removing the drill and core sample from the ground, enclosing the core sample with a casing to maintain the core sample in the same form and position as found in the ground, the casing including openings corresponding to different layers in the core sample, removing a soil sample through the openings in the casing.

4,534,232
ALTERNATING ROTARY TO RECIPROCATING ACTUATOR

Richard F. Stieg, Boulder, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Feb. 6, 1984, Ser. No. 577,435
Int. Cl.³ F16H *27/02*
U.S. Cl. 74—89.2 **3 Claims**



1. An alternating rotary to reciprocating type actuator comprising:

two disc type members, each having a rounded type rim that defines a circumferential portion interconnecting an inside sidewall portion and an outside sidewall portion, each circumferential portion having a plurality of circumferentially spaced convex grooves that individually extend into an interconnected inside sidewall at projected angles that are substantially equal and helically oriented, said grooves also individually extending into an interconnected outside sidewall portion where each groove is oriented in a predetermined chordal alignmemt with another of such grooves, the two disc members coaxially spaced from each other with at least one disc member free to rotate and axially move toward the other disc member, the disc members arranged with their inside sidewall portions facing each other with the helically oriented grooves of one disc generally in individual lineal alignment with similar individual grooves of the other disc; and

a cord interlaced in zig-zag fashion between said discs in said grooves such that the cord forms a plurality of substantially similarly arranged links between the two disc members.

4,534,233
WIRE-DRIVING DEVICE FOR WINDOW REGULATOR

Osamu Hamaguchi, Nishinomiya, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Filed Nov. 9, 1983, Ser. No. 550,149
Claims priority, application Japan, Apr. 18, 1983, 58-68117
Int. Cl.³ F16H *27/02*
U.S. Cl. 74—89.2 **4 Claims**

1. A wire-driving device for a window regulator comprising:

(a) a housing;

(b) a worm wheel mounted for rotational movement within said housing;

(c) a worm meshing with said worm wheel;

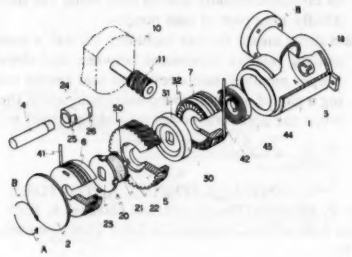
(d) an electric motor for driving said worm, having rotational axis arranged on a center plane of said worm wheel; said center plane being perpendicular to the rotational axis of said worm wheel;

(e) a first pulley arranged concentrically at one side surface of said worm wheel;

(f) a second pulley arranged concentrically at another side surface of said worm wheel;

(g) a first means for transmitting torque from said worm wheel to said first pulley comprising a cylindrical shock absorber having an axial center hall, one end portion connected to said worm wheel and the other end portion connected to said first pulley;

(h) a second means for transmitting torque from said worm wheel to said second pulley comprising said shock absorber in common and a shaft inserted into said axial



center hall of said shock absorber; said shaft having end portions connected to said one end portion of said shock absorber and to said second pulley respectively;

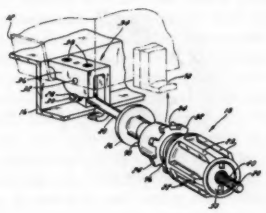
(i) a first wire having one end fastened to said first pulley and wound around said first pulley; and

(j) a second wire having one end fastened to said second pulley and wound around said second pulley in the opposite direction with respect to said first wire.

4,534,234
FASTENER OF THE HOLD-DOWN TYPE

Frank J. Cosenza, San Pedro, Calif., assignor to Rexnord Inc., Brookfield, Wis.

Continuation of Ser. No. 287,613, Jul. 28, 1981, abandoned. This application Jan. 11, 1984, Ser. No. 569,932
Int. Cl.³ F16H *27/02*
U.S. Cl. 74—89.15 **8 Claims**



1. An extractor hold down apparatus for use in selectively displacing and securing a unit mounted on a frame structure under a predetermined load, said apparatus including:

a first shaft, at least a portion of which is threaded and having one end thereof adapted to receive a pivot pin;

a second shaft mounted on said first shaft for axial movement along said threaded portion thereof;

drive means including a sleeve mounted on and coupled to said second shaft and a slip clutch means operative in a slip mode when the level of torque between said sleeve and said second shaft exceeds a predetermined amount; and

a keeper member rotatably mounted on said second shaft adjacent said drive means and coupled thereto for axial movement therewith;

said sleeve including a portion, adjacent said keeper member, having an inside radius greater than an outside radius of said keeper member adjacent thereto;

said keeper member being an annular cylindrical element

and having a plurality of spaced slots adapted to receive a hook member extending from a unit and securing said keeper member when rotated, said element having a frustocylindrical end forming a circular ramp, said ramp having an axially short part and an axially long part in which said plurality of spaced slots are positioned, one of said circumferentially spaced slots being cut deep into said axially short part of said ramp and another of said plurality of circumferentially spaced slots being cut shallow in said axially long part of said ramp;

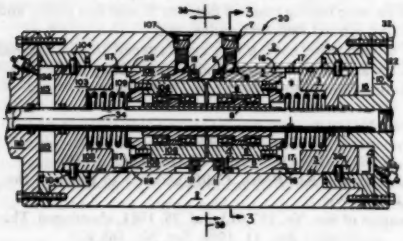
said drive means further including yieldable means for permitting relative movement between said sleeve and said keeper member, said sleeve and said keeper member having a gap of predetermined maximum width therebetween when the apparatus is not providing a load to the unit.

4,534,235

ROTARY STEPPER ACTUATOR

John P. Mitcham, Woodlands, and Michael A. Karr, Jr., Houston, both of Tex., assignors to Gray Tool Company, Houston, Tex.

Filed Nov. 1, 1983, Ser. No. 547,809
Int. Cl.³ F16H *27/02*
U.S. Cl. 74—128 **24 Claims**



6. An actuator for imparting unidirectional stepwise rotary motion to an elongated member about a central axis, comprising:

a housing, surrounding a portion of the elongated member and secured against rotary motion;

an outer race, disposed within the housing and rotatably supported therewithin;

an overrunning clutch, said clutch engageable between the outer race and the elongated member upon attempted relative rotation therebetween in the clockwise direction, and slippable between the outer race and the elongated member upon relative rotation therebetween in the counterclockwise direction;

a drive member, axially reciprocable from and to a rest position and coaxial with the elongated member;

means, operable only upon displacement of the drive member from the rest position, for engaging the drive member and the outer race for establishing a predetermined relative rotational orientation between the drive member and the outer race during the engagement thereof;

means for reciprocating the drive member from and to the rest position; and

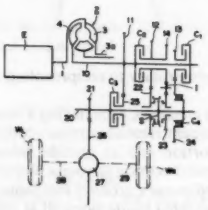
means, operable upon engagement of the drive member and the outer race, for imparting a clockwise rotary motion to the outer race upon displacement of the drive member from the rest position, and a counterclockwise rotary motion to the outer race upon return of the drive member to the rest position.

4,534,236

VIBRATION AND NOISE REDUCTION MEANS FOR A TRANSMISSION VEHICLE

Masao Nishikawa, Tokyo; Takashi Aoki; Yoichi Sato, both of Wako, and Hiroshi Yoshizawa, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,604
Int. Cl.³ F16H *3/08*; F16D *21/02*
U.S. Cl. 74—364 **4 Claims**



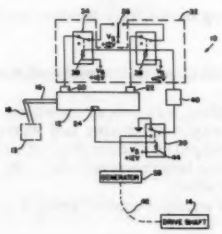
1. A transmission for a vehicle including an engine and at least one drive wheel, comprising: a first shaft driven by the engine; a second shaft for driving the drive wheel; a plurality of gear trains interposed between said first and second shafts; said gear trains being selectable for transmitting power of the engine; at least one gear member arranged in one of said gear trains and fitted on either of said shafts; a rotatable member relatively rotatable with respect to said gear member and slideably fitted on said either shaft; and resilient means for resiliently forcing said rotatable member to be brought into frictionwise slideable contact with said gear member while said one gear train is left unselected.

4,534,237

SHIFT CONTROLLER

Paul J. Carosino, 11245 E. Marginal Way South, Seattle, Wash. 98168

Filed Oct. 5, 1983, Ser. No. 539,329
Int. Cl.³ G05G *9/12*
U.S. Cl. 74—476 **20 Claims**



7. An apparatus for controlling operation of a shifter used

for shifting a transmission or the like connected to a rotatable shaft between at least one forward gear, neutral and at least one reverse gear, said shifter moving between a first position corresponding to said forward gear, and a second position corresponding to said reverse gear, movement between said first and second positions passing through a neutral position corresponding to said neutral, said shifter having a first actuator for movement of said shifter toward said first position and a second actuator for movement of said shifter toward said second position, comprising:

a manually operable shift control for selectively actuating said first or second actuators to move said shifter between said first, neutral and second positions;

a rotation sensor for sensing rotation of said shaft and generating a rotation-indicating singal;

a position sensor for sensing the position of said shifter, said position sensor inhibiting said rotation-indicating signal when said shifter is in said first or second positions, and transmitting said rotation-indicating signal when said shifter is in said neutral position; and

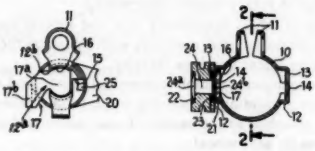
a disabler for preventing actuation of said first or second actuators by operation of said manually operable shift control, said disabler being responsive to said rotation indicating signal to prevent actuation of said shifter upon said rotation-indicating signal indicating rotation of said shaft, whereby the apparatus will permit gear changes among said forward gears or said reverse gears, but will prevent gear changes between said forward and reverse gears unless said shaft stops revolving with said shifter moved into said neutral position in preparation for changing between said forward and reverse gears.

4,534,238

LEVER AND COLLAR UNIT IN PARTICULAR FOR A CYCLE

Maurice E. L. Coué, Feucherolles, France, assignor to Huret et ses Fils, Nanterre, France

Filed Dec. 23, 1982, Ser. No. 452,710
Claims priority, application France, Dec. 30, 1981, 81 24503
Int. Cl.³ F16C *1/10*; G05G *11/00*
U.S. Cl. 74—489 **16 Claims**



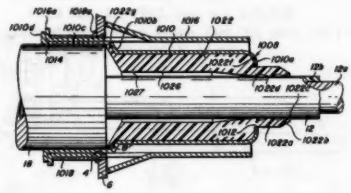
1. A collar and lever unit comprising a collar which has an axis and comprises, in one integral piece with the collar, at least one hollow portion which projects from the collar and has an axis extending substantially radially from said axis of the collar and defines, on an outer side of the projecting portion, a bearing surface for the lever, said bearing surface extending transversely of said axis of the projecting portion, said projecting portion further defining, on an inner side of the projecting portion, a cavity, an abutment member disposed in said cavity and forming an abutment for a sheath of a cable for combining with the unit, said projecting portion further defining a lateral opening having an abutment edge and through which opening said abutment member extends while being positioned against said abutment edge, and a journal carried by said projecting portion and extending from said outer side of said projecting portion, said lever being mounted on said journal to be rotatable about an axis of rotation.

4,534,239

BRAKE CABLE FITTING INCLUDING SCRAPER MEANS

Robert L. Heimann, Rte. 2, Huntsville, Mo. 65259

Continuation of Ser. No. 243,463, Mar. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 73,076, Sep. 6, 1979, Pat. No. 4,304,149. This application Jun. 14, 1984, Ser. No. 619,709
Int. Cl.³ F16C *1/10*
U.S. Cl. 74—501 R **3 Claims**



1. A cable assembly, comprising

(a) a tubular outer cable sleeve (**18**);

(b) an inner cable member (**12**) adapted for longitudinal displacement within said sleeve, said inner cable member including a stranded metal core portion (**12*a***), and a protective outer synthetic plastic layer (**12*b***) surrounding said core portion;

(c) a fitting body (**1008, 1108, 1206**) containing at one end thereof a longitudinal bore defining at the other end of the fitting a first end wall containing a through opening (**1012, 1110, 1208**), said fitting body also containing at said one end a longitudinal counterbore (**1014, 1108*c*, 1214**) defining a second end wall, said counterbore having a diameter corresponding generally with the outer diameter of said cable sleeve; and

(d) a tubular resilient seal member (**1022, 1112, 1212**) arranged concentrically within said bore in abutting engagement with said first end wall, said seal member containing a longitudinal through bore (**1026, 1126, 1226**) the diameter of which is greater than that of said inner cable member, thereby to define an annular lubrication chamber (**1027, 1127, 1227**) extending generally the length of said fitting body, said seal member including at one end an annular projecting portion (**1022*a*, 1112*a*, 1212*a***) that extends through said wall opening, said outer sleeve member being mounted in said fitting counterbore with said inner cable member extending longitudinally through said seal member projecting portion;

(e) said seal member including at the free extremity of said projecting portion radially inwardly directed annular first sealing means (**1022*d*, 1112*c*, 1212*d***) in concentric sealing engagement with said protective outer layer of said cable member, said projecting portion having at its free end a cylindrical inner peripheral surface of a diameter corresponding with the diameter of said inner cable member, said cylindrical inner surface terminating in a sharp scraper edge (**1022*c*, 1114, 1214**), thereby to scrape impurities from the inner cable member upon longitudinal displacement thereof relative to said sleeve;

(f) said seal member further including at its other end an outwardly extending annular flange portion (**1022*g*, 1112*d*, 1212*c***) defining second sealing means compressed between the end of said sleeve and said second end wall, said first and second sealing means being operable to close the ends of said lubrication chamber.

4,534,240

ACTUATING KNOB, PARTICULARLY FOR WINDOW CRANKS OF AUTOMOTIVE VEHICLES

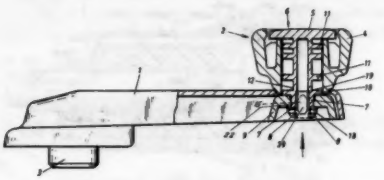
Günter Dietz, and Friedhelm Flagmeyer, both of Wuppertal, Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 196,932, Oct. 14, 1980, abandoned. This application May 11, 1983, Ser. No. 493,631

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952057

Int. Cl.³ G05G *1/02*; B25G *3/00*

U.S. Cl. 74—545 **12 Claims**



1. In an automotive vehicle having a window crank, said window crank having a breakaway actuating knob, said knob comprising:

an outer knob part for serving as a grip; an inner knob part surrounded by the outer knob part; the inner knob part serving as a pivot pin and the outer knob part having a recess therein in which the pivot pin is received;

the pivot pin being insertable into an opening of said window crank; the pivot pin including detent pins and the detent pins including outward projections thereon for clip mounting of the pivot pin on a connection part defined in the opening of the window crank on which the actuating knob is used;

a blocking member being installed between the detent pins for holding the detent pins apart and for urging the outward projections to the connecting part for preventing separation of the outward projections from the connecting part;

the pivot pin having a breakaway section defined along the pivot pin by a stepped borehole within said pivot pin; said outward projections including a flange extending outwardly from said pivot pin at the location of said step in said borehole; said connecting part comprising a support in said opening of said crank having a surface receiving and positioning said flange; any bending movement on said pivot pin being transmitted to the said meetng surfaces of said flanges and said support and thereby being concentrated at said step in said borehole to cause any break which occurs to occur at the location of said step in said borehole.

4,534,241

CRANKSHAFT FOR COMBUSTION ENGINES

Arne Remmerfelt, and Sten Larsson, both of Skövde, Sweden, assignors to AB Volvo, Goteborg, Sweden

PCT No. PCT/SE82/00323, § 371 Date Jun. 2, 1983, § 102(e) Date Jun. 2, 1983, PCT Pub. No. WO83/01283, PCT Pub. Date Apr. 14, 1983

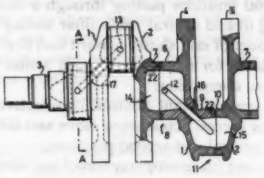
PCT Filed Oct. 7, 1982, Ser. No. 503,193

Claims priority, application Sweden, Oct. 8, 1981, 8105965

Int. Cl.³ F16C *3/10, 3/14*

U.S. Cl. 74—597 **5 Claims**

1. A crankshaft for combustion engines, comprising a plurality of components joined together so as to form together main bearing journals, crank bearing journals and counterweights, each component having a portion of a main bearing journal and a portion of a crank bearing journal, the main bearing journal portions of two adjacent components being secured together to form a complete main bearing journal and the crank bearing journal portions of two adjacent components being joined together to form a complete crank bearing journal, said joined-together journal portions defining between them closed cavities in both the main bearing journal and the crank bearing journal, one said portion of each pair of joined-



together journal portions being longer than the other, and an oil duct passing through said cavities but sealed from communication with said cavities and having open ends that open through the bearing surfaces of the longer ones of said journal portions.

4,534,242

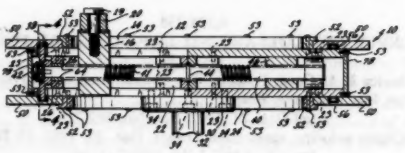
VARIABLE POWER TRANSMISSION FOR CONVERTING RECIPROCATING MOTION TO ROTARY MOTION

David M. Brockelbank, 8954 Kennedy St., Riverside, Calif. 92509

Continuation of Ser. No. 237,741, Feb. 24, 1981, abandoned. This application Feb. 27, 1984, Ser. No. 584,168

Int. Cl.³ F16C *3/28*; F16H *21/20*

U.S. Cl. 74—600 **12 Claims**



1. A variable power transmission for converting reciprocating motion to rotary motion comprising:

a rotatable wheel comprising first and second spaced apart interconnected disk members with openings therethrough forming linear bearings thereby;

a crank member rotatably connected at one end to a crank pin for providing a rotatable force to said wheel;

a shaft attached to the center of said wheel said shaft being driven by said wheel;

means for selectively positioning said crank pin to any selected position along the radius of said wheel, said means for selectively positioning said crank pin along the radius of said wheel to any selected positioning comprises first and second first engaging means carried by first and second ring members each ring member positioned around the outer periphery of one of said desk members, each ring member being loosely connected to its associated disk, a threaded jack shaft rotatably attached to and positioned between said disk members, second engaging means carried by an outer end of said shaft and rotatable relative thereto for engaging both of said first engaging means, a crank slide block with said crank pin located on its outer end with its central portion threadedly engaging said jack shaft, said crank slide block extending through the openings in said first and second disk members and is guided and supported by said linear bearings, counter balance means carried in threaded engagement on said jack shaft and located opposite said crank slide block and braking means independently associated with each of said first

engaging means for selectively stopping the rotation of a selected one of said pair of first engaging means;

clutch means selectively adjustable through a range of different load limits positioned in series between the interconnection of said second engaging means and jack shaft to provide relative rotation between said jack shaft and second engaging means when an adjusted load limit between said second engaging means and said jack shaft is exceeded; and

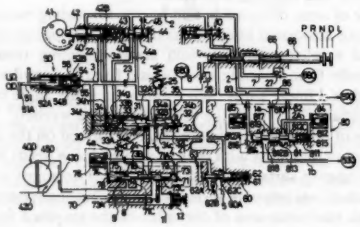
adjustment means for selectively adjusting the load limit between said shaft end and said second engaging means through a range of different loads.

4,534,243

HYDRAULIC CONTROL SYSTEM FOR A V-BELT TRANSMISSION

Shoji Yokoyama, Anjo, and Shiro Sakakibara, Toyokawa, both of Japan, assignors to Aisin Warner Kabushiki Kaisha, Japan

Filed Apr. 26, 1983, Ser. No. 488,842
Int. Cl.³ B60K *41/14*; F16H *55/52*
U.S. Cl. 74—868 **3 Claims**



1. An automatic transmission for a vehicle having an internal combustion engine with a throttle opening, comprising:

a continusouly-variable speed transmision mechanism including an input shaft, an output shaft, an input variable-pitch pulley having a fixed pulley flange fixed concentrically to said input shaft and a movable pulley flange mounted concentrically with and axially slidably on said input shaft, an output variable-pitch pulley having a fixed pulley flange fixed concentrically to said output shaft and a movable pulley flange mounted concentrically with and axially slidably on said output shaft, and endless belt interconnecting said input and said output variable-pitch pulleys and hydraulic servomotors provided for said input and said output variable-pitch pulleys respectively for pressing the corresponding movable pulley flanges toward the corresponding fixed pulley flanges; and

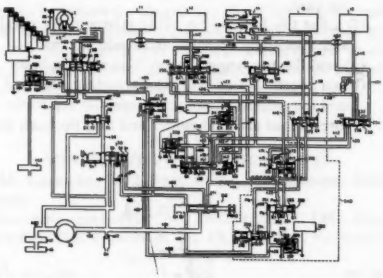
a hydraulic control circuit including a pressure generating source, regulator valve means to control the fluid pressure of said pressure generating source and adapted to generate a line pressure corresponding to pressure signals fed thereto, throttle pressure valve means to control said line pressure and adapted to generate a pressure corresponding to the throttle opening of the internal-combustion engine which has a predetermined value, when the throttle opening is zero, and to feed the pressure to said regulator valve means as a throttle pressure signal, ratio detecting valve means formed in said output shaft to control said line pressure and adapted to generate a pressure corresponding to an axial displacement of said movable pulley flange of said output variable-pitch pulley mounted on one of said shafts and to feed the pressure to said regulator valve means as a reduction ratio pressure signal, means to supply pressurized fluid at the line pressure to the hydraulic servomotor provided for said output variable-pitch pulley, reduction ratio control valve means provided with an axially slidable spool and two pressure chambers formed therein at both axial ends of the spool and adapted to selectively control the supply of said line pressure to the hydraulic servomotor of said input variable-pitch pulley through the movement of said spool and having fluid passages connecting said two pressure chambers of said reduction ratio control valve means, respectively, to the output side of said throttle pressure valve means and two solenoid valves for individually regulating the respective pressures in said pressure chambers.

4,534,244

AUTOMATIC TRANSMISSION GEAR SYSTEM FOR VEHICLES

Takeo Hiramatsu, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,319
Claims priority, application Japan, Oct. 30, 1981, 56-174080
Int. Cl.³ B60K *41/06*
U.S. Cl. 74—869 **3 Claims**



1. An automatic transmission gear system for vehicles comprising a plurality of advance gears, a oneway clutch for achieving a gear shift at a lower speed and a friction engagement device provided in parallel with said oneway clutch and operated by oil pressure, a manual valve connected to a source of oil pressure, which is a characterized in that it is provided with detecting means which detect at least one parameter indicating the operating or driving conditions of the vehicle, and an oil pressure control device which is fluidly interposed between the manual valve and the friction engagement device and which supplies said friction engagement device with a high pressure oil when the engine brake is necessary at said gear shift at the lower speed and with a low pressure oil at which said friction engagement device is substantially released when the engine brake is not necessary in correspondence with the signals transmitted from said detecting means, said oil pressure control device including first and second valve means fluidly coupled together and to the manual valve, said first and second valve means cooperating so that when one valve means is controlling oil pressure, the other valve means is inoperative, each valve means also being an oil pressure pulse accumulator when it is not controlling oil pressure, and a solenoid valve means connected to said detecting means and to said first and second valve means for detecting different driving conditions to control operation of said first and second valve means, and a speed shifting valve connected to said first and second valve means and to said friction engagement device to supply oil to that friction engagement device from said first and second valve means.

4,534,245

TIGHT-GRIP WRENCH

William F. Rossmann, 2431 Highwood Dr., McHenry, Ill. 60050

Filed Nov. 21, 1983, Ser. No. 553,408
Int. Cl.³ B25B *13/28*
U.S. Cl. 81—90.1 **9 Claims**

1. A tight-grip wrench combining desirable features of an open-end wrench, a closed end wrench, a box end wrench, a

flare nut wrench, and a ratchet wrench; said tight-grip wrench including a handle, a large jaw operatively secured to said handle, and a small jaw operatively secured to said large jaw and operable by action of said handle; wherein:

a. said handle includes a tip end and a grip end oppositely disposed from said tip end;

(1) said grip end serving as a gripping place for the user of a wrench; and

(2) said tip end having a tip operatively cooperating with said small jaw, said tip including;

(a) a tip base situated between an arced shoulder, and a straight shoulder;

(b) said tip base, said arced shoulder, and said straight shoulder being substantially colinear;

(c) said tip protruding from said tip base;

(d) said tip including a flat side;

(e) said flat side being substantially perpendicular to said tip base, and between said straight shoulder and said tip base;

(f) a flat top for said tip being substantially parallel to and oppositely disposed from said tip base;

(g) said flat top being shorter than said tip base;

(h) an arced side of said tip oppositely disposed from said flat side and connecting said flat top to the juncture of said arced shoulder and said tip base; and

(i) a holding means adjacent said tip end for holding said handle in said wrench;

b. said large jaw has a solid section and slotted section;

(1) said slotted section receiving said handle and said small jaw in an operative relationship; and

(2) said slotted section including means for securing said handle to said large jaw and means for securing said small jaw to said large jaw;

c. said small jaw has:

(1) a nut gripper;

(2) a small jaw aperture within said nut gripper;

(3) a nobbed nut contact on said nut gripper;

(4) a flat nut contact adjacent said nobbed nut contact;

(5) a small jaw base oppositely from said nut gripper on said small jaw;

(6) a base notch within said small jaw base;

(7) said tip of said handle being received in said base notch; and

(8) said base notch having pair of substantially parallel sides;

whereby said arced side and said flat side cooperate with said base notch to move said wrench as desired between an open position and a closed position.

4,534,246

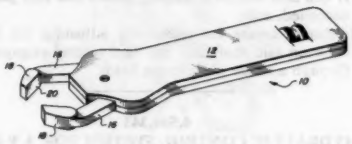
ADJUSTABLE WRENCH

Chris McNulty, 96 Wellington Dr., Farmington, Conn. 06032

Filed Dec. 2, 1982, Ser. No. 446,277

Int. Cl.³ B25B *13/28*

U.S. Cl. 81—111 **10 Claims**



1. A wrench for six-sided fasterners comprising:

a handle having a fixed flat anvil surface centered on one end of said handle, said fixed flat anvil surface being in an abutting relationship with an entire one side of the fastener when said fastener is gripped,

a pair of arms mounted in said handle for sliding movement along associated linear paths between a gripping position and a release position, said arms projecting from said handle from opposite sides of said fixed flat anvil surface and said linear paths each forming an acute angle of substantially 16°6′ with the centerline of the wrench,

a pair of opposed gripping heads, one formed on the end of each of said arms with each of said gripping heads having a gripping surface, said gripping heads arranged so that each of said gripping surfaces is in an abutting relationship with the entire one of the sides of the six-sided fastener when said arms are in said gripping positions, said gripping surfaces and said fixed flat anvil surface being arranged to apply substantially equiangular gripping force to three alternate sides of said six-sided fastener,

means for moving said arms along said linear paths between said gripping and releasing positions.

4,534,247

METHOD AND APPARATUS FOR CONTROLLING THE FEEDING OF A BANDSAW BLADE IN BANDSAW MACHINES

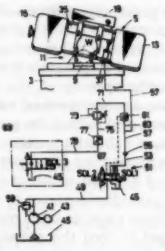
Masayuki Taguchi, Hadano, Japan, assignor to Amada Company, Limited, Japan

Filed Jun. 7, 1983, Ser. No. 501,888

Claims priority, application Japan, Jun. 7, 1982, 57-96322

Int. Cl.³ B26D *1/46*

U.S. Cl. 83—13 **8 Claims**



1. A method for controlling bandsaw machines having an endless bandsaw blade, comprising:

applying a feeding force to a workpiece for feeding the workpiece into an endless bandsaw blade for making a cutting; and

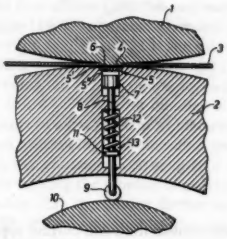
using a timer to periodically interrupt the application of the feeding force of the workpiece into the endless blade.

4,534,248

METHOD AND AN APPARATUS FOR THE REMOVAL OF WASTE MATERIAL IN ROTARY PUNCHING

Thorbjörn Andersson, Södra Sandby, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Nov. 30, 1983, Ser. No. 556,567
Claims priority, application Sweden, Dec. 1, 1982, 8206853
Int. Cl.³ B26F *1/08*
U.S. Cl. 83—24 **12 Claims**



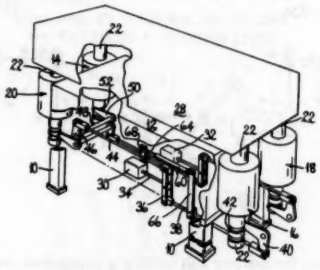
1. A method for the removal of waste material in punching units with cooperating rolls comprising the steps of: providing a number of holes in one of the rolls for receiving punched out waste material, locating a piston in each hole moveable between an inner retracted position, an intermediate position, and an outer extended position, providing an airtight relationship between each piston and walls of each associated hole, creating a vacuum in a hole at the same time waste material is received by retracting the piston, and ejecting the waste material by extending the piston when the roll has been rotated so as to place the hole having the waste material at an ejecting station.

4,534,249

STROKE CONTROL FOR PRESS

Richard J. Smith, Bristol, England, assignor to USM Corporation, Farmington, Conn.

Filed Jun. 3, 1982, Ser. No. 384,546
Claims priority, application United Kingdom, Jun. 6, 1981, 8117390
Int. Cl.³ B26D *5/00*
U.S. Cl. 83—74 **6 Claims**



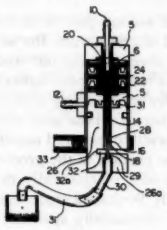
1. A cutting press comprising:
a. two platens one of which is supported by a plurality of columns for movement towards and away from the other to effect cutting and return strokes of the press,
b. drive means connected to the columns for effecting such movement of the movable platen, and
c. stroke control means for limiting the movement of the movable platen towards the other platen, said stroke control means comprising a limit switch actuation of which is effective to reverse the operation of the drive means, whereby the cutting stroke is terminated and a return stroke is initiated,
d. said stroke control means comprising a control circuit having,
e. signalling means by which a signal is generated the magnitude of which at any time during a cutting stroke is dependent upon the sum of the distance moved by two portions of the movable platen, which portions are symmetrically located with respect to the columns.
f. comparator means by which the magnitude of the signal is compared with a preselected value,
g. switch actuating means by which, when the magnitude of said signal equals the preselected value, the limit switch is actuated, and
h. said stroke control means comprises a further limit switch actuation of which is effective to terminate the return stroke of the press, together with further comparator means by which the magnitude of the signal generated by the signalling means is compared with a further preselected value, and further switch actuating means by which said further limit switch is actuated, when the magnitude of said signal equals the preselected value.

4,534,250

MINIATURE PNEUMATIC PUNCH

Jose M. Garrocho, 7572 Rockhill Rd., Mississauga, Ontario, Canada

Continuation-in-part of Ser. No. 250,260, Apr. 2, 1981, Pat. No. 4,418,596. This application Jul. 19, 1983, Ser. No. 515,178
Int. Cl.³ B26F *1/14*
U.S. Cl. 83—98 **15 Claims**



1. A miniature pneumatic punch for cooperation with a photograph printing mechanism in which a strip of photographic print paper on which negatives are sequentially exposed within an exposure area onto consecutive segments as the paper is fed in a linear direction through the pneumatic punch so that a hole may be precisely punched in the paper to mark each segment during the exposure stage of the printing process, said pneumatic punch comprising:
(a) a cylinder body having located in the upper extent thereof a chamber wherein is seated a piston to be pneumatically driven between upper and lower limits within said chamber and having located within the lower extent thereof below said chamber body means for supporting and guiding a strip of photographic print paper linearly through said pneumatic punch;
(b) passage means positioned centrally within said body means for slidably receiving an elongated guide centrally secured at one end to said piston, the free end of said guide terminating in a punch;
(c) said body means including die means located adjacent to but outside the exposure area in axial alignment with said passage means and said guide for flushly receiving the punch when the piston is driven to said lower limit;
(d) said body means further including notch means disposed

in said body means between said passage means and said die means for receiving and guiding the edge of a strip of photographic print paper linearly through said pneumatic punch, and said die means including edge means generally aligned with one boundary of the exposure area and located transverse to the direction of travel of the paper such that the exposure area is clear and unobstructed by any portion of said pneumatic punch, thereby maximizing the exposure area; and

(e) pneumatic driving means including a pair of air inlet ports located in said chamber and separated by said piston against fluid communication within said chamber for driving said piston between said upper limit and said lower limit.

4,534,251

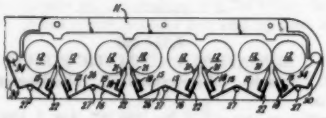
STRIPPING ASSEMBLY FOR NOODLE CUTTING MACHINERY

Michael S. Wilson, 34 Overhill Rd., Melville, N.Y. 11747

Filed Sep. 29, 1982, Ser. No. 426,738

Int. Cl.³ B26D *7/18*

U.S. Cl. 83—111 **5 Claims**



1. An improved construction for alimentary paste noodle cutting machines comprising

a pair of side frame members disposed in parallel spaced relation,

at least a first and second pair of counter rotating roller cutters mounted therebetween for severing introduced alimentary paste sheet material into discrete noodle strips,

each pair of counter rotating roller cutters having a plurality of complementally intermeshing lands and grooves on the facing surfaces thereof whose axial dimensions are determinative of the width of severed noodle product emanating from the base portion of the grooves therein,

a stripper comb holder of elastically deformable material having a generally W-shaped cross section and of a transverse extent to substantially span the distance between said side frame members,

said generally W-shaped comb holder having a pair of downwardly directed and angularly diverging inboard arm members transversely joined to form an upwardly directed transversely disposed intermediate apex and pair of upwardly directed diverging outboard arm members each joined to a dependent end of one of said inboard arm members and terminating in first and second exposed marginal edges disposed in substantially parallel spaced relation with said transversely disposed intermediate apex,

stripper comb mounting means associated with the first and second exposed marginal edges of said outboard arm members of said comb holder,

stripper combs each having a base portion removably engageable with said mounting means and a plurality of terminally tapered stripping teeth complementally sized to be contained within the grooves on said roller cutters extending outwardly therefrom, and

means extending inwardly from said side frame members intermediate said first pair and said second pair of roller cutters for supporting said intermediate apex of said comb holder to spring bias the ends of said teeth of stripper combs counted in said mounting means in tangential compressive relation with the surface of said grooves in one of said roller cutters forming the first pair thereof and in the adjacent roller cutter of the second pair thereof.

4,534,252

LEDGER FOR CUT-OFF DEVICES IN CIGARETTE MACHINES

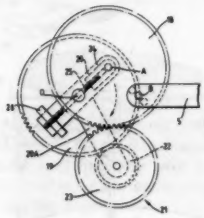
Timothy C. Harrington, Aylesbury, and John K. Horsley, High Wycombe, both of England, assignors to Molins PLC, London, England

Filed Nov. 5, 1982, Ser. No. 439,610

Claims priority, application United Kingdom, Nov. 5, 1981, 8133404

Int. Cl.³ B26D *1/56*

U.S. Cl. 83—310 **7 Claims**



1. A ledger mechanism for a rod cutting apparatus, comprising a ledger; a coupling rod on which the ledger is fixedly mounted; and a pair of spaced gear arrangements each having a gear ratio of 2:1 to generate a pair of points, one point on each gear arrangement, which reciprocate in sycnhronism along straight parallel paths, wherein the coupling rod is pivotally coupled at one end to one of said pair of points on one gear arrangement, and at its opposite end to the other of said pair of points on the other gear arrangement so that the ledger reciprocates linearly, each gear arrangement comprising a planetary gear which orbits around an axis of a fixed gear and meshes with said fixed gear through an idler gear, first adjustment means for adjusting a first distance between the axes of said fixed and planetary gears, and second adjustment means for adjusting a second distance between the axis of said planetary gear and said point on said gear arrangement.

4,534,253

FEEDING AND CUTTING DEVICE FOR A CONTINUOUS WEB

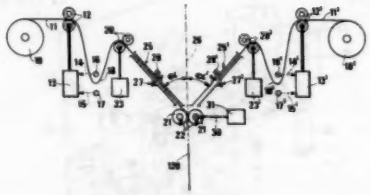
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa' per Azioni, Bologna, Italy

Filed May 24, 1982, Ser. No. 381,046

Claims priority, application Italy, Jun. 3, 1981, 3453 A/81

Int. Cl.³ B25D *1/56*; B23D *25/02*

U.S. Cl. 83—336 **14 Claims**



1. A device for feeding and cutting a continuous web (11, 11') into cut pieces (120), having automatic reel change for a reel from which the web is unwound, including a cyclic cutting device (21) located at the confluence of two tracks (25) along which two continuous webs (11, 11') unwound from corresponding reels (10, 10') are fed, and control means (74, 74') generating a signal when an associated reel becomes empty; there being provided feed means (12, 20) for feeding said webs from the said reels (10) along each of the said tracks to the said cutting device (21), and the said feed means includ-

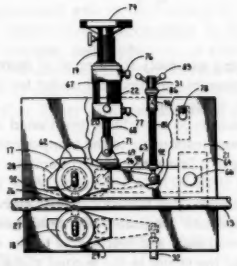
ing, for each track, a pair of feed rollers (20) for feeding the associated web (11) to the said cutting device (21); the said device including a pulse generating unit (33, 34) for generating pulses which are phase related to the said cutting device (21) and a frequency of which is a function of a cutting frequency of the said device (21), and means (23) constituted by stepping motors controlled by the said pulse generating unit (33) for directly driving the said pair of rollers (20) in one direction for feeding said web and in a reverse direction for retracting said web; the said feed means (12, 20) comprising as well as the said pair of feed rollers (20) actuated by a first control circuit (23, 72), at least one pair of unwinding rollers (12) actuated by a second control circuit (13) to unwind the said web from a reel (10) towards the said feed rollers (20), the said second control circuit including means (16, 17) operable to maintain a substantially zero tension on the said web (11) at the said feed rollers (20) during the whole of the unwinding of the reel (10), the said stepping motor (23) being fed at each operating cycle by means of a control circuit (67, 47, 72) with a number of pulses (38) determining the passage of a cut piece of predetermined length between the said feed rollers (20), and including means (66) for selectively changing the predetermined length of the said cut piece, the said means varying the number of pulses (38) sent to the said stepping motor (23), the device further including reel change means (80, 88, 94, 86) actuated by the said means (74, 74') for detecting when a first web has been used up and, in a first operating cycle, simultaneously with the production of a piece cut from the said first web (11), controlling the arrival and stopping of the end of a second, replacement web (11') at the said cyclic cutting means (21), and in following operating cycles controlling the supply of only the said replacement web (11') to the said cyclic cutting means (21) to obtain pieces cut only from the said second web (11'), and including means (27, 27') for positioning the end of the said replacement web (11') at a predetermined distance from the said cyclic cutting means (21) during the unwinding of the first web (11), the said reel change means controlling the advancing movement of the said replacement web (11') in the operating cycle following that in which the said means (74) for detecting the end of the web being unwound are activated, and controlling a retraction of the end of the web (11) which is running out from the said cutting means (21) during the first operating cycle producing a piece (120) cut from the said second replacement web (11').

4,534,254

CABLE STRIPPING APPARATUS

Mieczlyslaw Budzich, Lexington, and Forest G. Fitz, Jr., West Columbia, both of S.C., assignors to AT&T Nassau Metals Corporation, Gaston, S.C.

Filed Aug. 29, 1983, Ser. No. 527,548
Int. Cl.³ H02G *1/12*; H01B *15/00*
U.S. Cl. 83—425.2 **12 Claims**



1. Apparatus for stripping the outer layers from cable comprising drive means including:

first and second drive wheels for pulling the cable through the cutting region of the apparatus;

first stationary cutting means located within a slot in said first drive wheel and extending beyond the periphery thereof toward said second drive wheel;

second stationary cutting means located within a slot in said second drive wheel and extending beyond the periphery thereof toward said first drive wheel;

said drive wheels and said cutting means defining the cutting region of said apparatus;

means associated with said first cutting means for adjusting the distance said cutting means extends beyond the periphery of said first drive wheel;

means associated with said second cutting means for adjusting the distance said cutting means extends beyond the periphery of said second drive wheel;

said first and second cutting means being located along an imaginary line joining the rotational axes of said first and second drive wheels;

means associated with said first drive wheel for permitting said wheel to be moved up and down in response to diametric variations in cable diameter;

means connected to said last mentioned means for controlling the rate of up and down movement of said first wheel and said first cutting means as cable passes through the cutting region;

a first motor connected to said first drive wheel; and

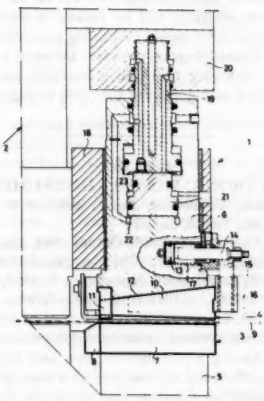
a second motor connected to said second drive wheel, both of said motors being characterized by high torque and low revolutions per minute, said first motor being moveable with said first drive wheel.

4,534,255

SHEARING MACHINE FOR METAL SHEET HAVING BLADES AT RIGHT ANGLES CONSISTING OF MUTUALLY MOVABLE SEGMENTS

Guido Salvagnini, Sarego, Italy, assignor to Salvagnini Transferica S.p.A., Sarego, Italy

Filed May 24, 1983, Ser. No. 497,713
Claims priority, application Italy, Jun. 9, 1982, 21778 A/82
Int. Cl.³ B26D *5/12*
U.S. Cl. 83—530 **15 Claims**



1. A shearing machine for sheet metal comprising upper and lower cooperating blades positioned for shearing action therebetween, each blade having two perpendicular segments, the lower blade being carried by a stationary support and the two upper blade segments being carried by a single vertically reciprocating support, wherein each segment of the upper blade is movably connected to said single reciprocating support so as to be selectively independently displaceable with respect to the

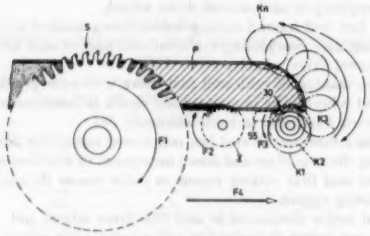
other segment and to said reciprocating support in order to vary the vertical distance of the selected segment from the lower blade and selectively to remove said selected segment from the shearing action.

4,534,256

DEVICE FOR MAKING A GROOVE IN THE EDGE OF A PANEL

Gino Benuzzi, 5, Via Angelo Custode, Bologna, Italy

Filed Oct. 18, 1982, Ser. No. 434,812
Claims priority, application Italy, Oct. 20, 1981, 3554 A/81
Int. Cl.³ B27B *5/00*
U.S. Cl. 83—863 **9 Claims**



1. In a sawing machine for cutting panels (P) and the like, of the type in which said panels (P) are supported on a horizontal table (A) and a main circular saw (S) mounted on a movable carriage (C) effects the cutting in a vertical plane and moves across said table (A) along a horizontal cutting line, and having a grooving device for making at least one groove or incision in the edge of seid panels (P) at the line of exit of said circular saw (S) out of said panels (P), the improvement wherein said grooving device comprises at least one rotary grooving tool (30) mounted on the same carriage (C) as said main circular saw (S) for movement therewith, and being guided by feeler means (31', 32'') along a path corresponding to the contour of an edge of a said panel being cut, and wherein said rotary grooving tool (30) is mounted on a movable side (12) of an articulated parallelogram structure (1, 13, 11, 12–9, 10, 14, 15) mounted on said carriage (C) by means of another side (1) rigidly secured thereto, means (17) being provided for moving said articulated parallelogram structure between a rest position in which said grooving tool (30) is inactive, and a working position in which said grooving tool (30) engages said panels (P).

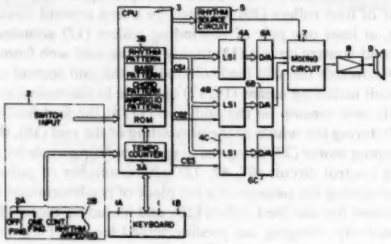
4,534,257

ELECTRONIC MUSICAL INSTRUMENT

Tsuyoshi Mitarai, Yokohama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 432,998, Oct. 6, 1982, abandoned. This application Aug. 27, 1984, Ser. No. 644,666
Claims priority, application Japan, Oct. 9, 1981, 56-161411
Int. Cl.³ G10H *1/38, 1/40, 7/00*
U.S. Cl. 84—1.03 **11 Claims**

1. An electronic musical instrument comprising:
a keyboard having a plurality of keys, said keys including keys for performing at least one of a melody and an accompaniment;
at least one musical tone signal generating means having a plurality of tone signal generating channels, said tone signal generating channels being switchable on a time division basis, each tone signal generating channel producing a musical tone signal, said musical tone signal generating means including means for generating one or more of the musical tone signals simultaneously;
manual switch means for selecting a performance mode using the musical tone signals generated by said musical tone signal generating means;
said manual switch means including means for selecting at least one of chord, bass and arpeggio as an accompaniment; and
channel control means for allotting tones corresponding to at least one of melody and accompaniment determined by key operations on said keyboard to different ones of said



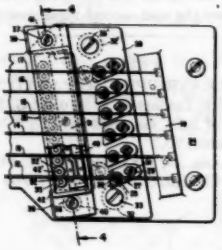
tone signal generating channels depending on a performance mode selected by said manual switch means, said channel control means allotting tones of the melody to at least one of said tone generating channels in one performance mode selected by said manual switch means, and allotting tones of the accompaniment to said at least one of said tone generating channels in another performance mode selected by said manual switch means.

4,534,258

TRANSDUCING ASSEMBLY RESPONSIVE TO STRING MOVEMENT IN INTERSECTING PLANES

Norman J. Anderson, 2 Schmitt La., Flanders, N.J. 07036

Filed Oct. 3, 1983, Ser. No. 538,526
Int. Cl.³ G10H *3/18*
U.S. Cl. 84—1.15 **18 Claims**



1. A transducing assembly for a musical instrument having magnetically permeable strings held under tension between a pair of supports, comprising:
a first reluctance type transducer positioned on one side of said string, and responsive to the component of movement of the string in a first plane for producing a first electrical signal,
a second reluctance type transducer positioned on the other side and displaced longitudinally along said string from said first transducer, and responsive to the component of movement of the string in the second plane at a predetermined angle to said first plane for producing a second electrical signal,
a pair of audio channels, and
an independent output circuit connected to each of said

transducers for supplying each of said signals to a respective channel.

4,534,259

CHIN REST FOR A VIOLIN OR THE LIKE

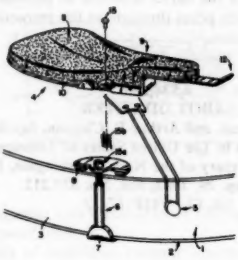
Wilhelm Wolf, Zandweg 78, NL-DeMeern (UTR), Netherlands

Filed Jan. 28, 1983, Ser. No. 461,756

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1982, 3205292; Sep. 4, 1982, 3232996

Int. Cl.³ G10D *3/18*

U.S. Cl. 84—279 **3 Claims**



1. A chin rest for a violin or the like comprising:
a chin rest attached to a chin rest base plate;
at least one support beacket adapted to grip the body of said violin;
pivot means pivotally connecting said base plate to said support bracket; and
a return spring biassing said base plate to a start position.

4,534,260

STRING MUSICAL INSTRUMENT

Leo L. Burrell, 6005 Tuscarawas Rd. Beaver, Pa. 15009

Filed Jun. 4, 1984, Ser. No. 617,515

Int. Cl.³ G10D *3/00*

U.S. Cl. 84—293 **10 Claims**

1. A string musical instrument comprising a body and fretboard having substantially aligned longitudinal center-lines, a string supporting assembly, including a bridge on one end of said instrument and a nut and head on the other end thereof, said bridge and nut being rotated, one relative to the other, about the longitudinal axis of said assembly, said fretboard being twisted progressively throughout its length to correspond to said rotation, and a plurality of strings mounted on said assembly and disposed at progressively varying angles to the top surface of said body throughout said longitudinal axis, whereby chording finger positions are made comfortable.

4,534,261

VENT KEY MODIFICATION FOR FLUTE

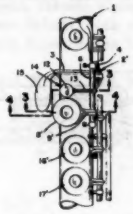
Raymond Fabrizio, 780 Dry Creek Rd., Monterey, Calif. 93940

Filed Mar. 30, 1983, Ser. No. 480,388

Int. Cl.³ G10D *7/02*

U.S. Cl. 84—384 **4 Claims**

1. An improvement in a modern Boehm system flute having a closed G# which is opened by a G# lever and includes a duplicate G# key and extra hole comprising:
a. deleting said duplicate G# key and extra hole;
b. a vent means having an open area substantially smaller than said extra hole opening;
c. vent cover means for selectively closing said open area;
d. said vent means is longitudinally located between said deleted extra hole and the A hole of said flute;
e. a G key selectively covering said A hole;



f. connection means permitting the controlled conjoint opening and closing of said G key and said vent cover means; and
g. relocating said G# lever toward the open end of said flute to provide space for said vent means and elongating the length of said lever to permit standard fingering.

4,534,262

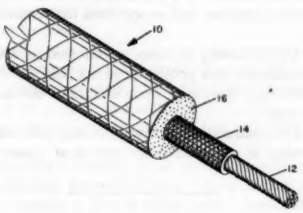
SAFETY MOORING LINE

Richard C. Swenson, Carriere, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1983, Ser. No. 481,522

Int. Cl.³ D04C *1/12*

U.S. Cl. 87—6 **4 Claims**

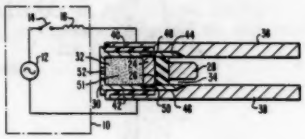


1. A safety mooring line for reducing snapback hazard, said mooring line comprising:
a highly stretchable safety line formed of a high stretch material;
an armor layer formed of a heat resistant, low stretch and high strength synthetic fiber material, braided over said safety line with a high braid angle so as to be able to stretch and elongate with stretch of said safety line; and
an outer strength member formed of a high strength, low stretch synthetic fiber braided over said armor layer and safety line so as to have a relatively low stretch characteristic and to be the load-bearing component of said mooring line;
said armor layer and said safety line being relatively unstretched whenever said strength member is under load and being readily stretched in the event of parting of said strength member so as to delay parting of said safety line and armor layer which guide recoil of the parted ends of said strength member telescopingly therealong, said armor layer being operative to protect said safety line from being broken as a result of heat and laceration by said parted ends as they recoil therealong, thereby preventing total snapback of said mooring line.

4,534,263
ELECTROMAGNETIC LAUNCHER WITH HIGH REPETITION RATE SWITCH

Carl J. Heyne, Hampton Township, Allegheny County, and Daniel W. Deis, Churchill Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 19, 1982, Ser. No. 399,510
Int. Cl.[3] F41F *1/02;* H02K *41/02;* H01H *85/18*
U.S. Cl. 89—8 23 Claims



1. A switch for conducting current between two conductive rails and for commutating said current into a conductive armature between said rails, said switch comprising:

a conductive cartridge shaped to make sliding electrical contact with said rails, said cartridge having a pressure chamber and an aperture for receiving a projectile;

means for increasing pressure within said pressure chamber to accelerate said projectile toward a muzzle end of said rails and to accelerate said cartridge in the opposite direction; and

means for conducting current between said rails and for propelling said projectile along said rails.

10. An electromagnetic projectile launcher comprising:

a pair of generally parallel conductive rails, said rails forming a bore having a breech end and a muzzle end;

a source of current, connected to said rails;

a conductive switch cartridge in sliding electrical contact with said rails at the breech end, said cartridge; having a pressure chamber and an aperture for receiving a projectile;

means for increasing pressure within said pressure chamber to accelerate said projectile along said cartridge and to remove said cartridge from electrical contact with said rails; and

means for conducting current between said rails after said cartridge is removed from electrical contact with said rails.

4,534,264
RECOIL REDUCER

Sherwin S. Tarnoff, 3309 N. Mannheim Rd., Franklin Park, Ill. 60131, and Mikio Sano, 3319 Manheim Rd., Franklin Park, Ill. 60062

Filed Apr. 6, 1983, Ser. No. 482,588
Int. Cl.[3] F41C *21/18*
U.S. Cl. 89—14.3 2 Claims

1. A firearm, of automatic piston type, utilizing a cartridge having a propellant and a projectile, and mechanism for firing the cartridge, and including a barrel having a uniform diameter bore through which the projectile is propelled by the gases of explosion of the propellant, and further, having a shroud slidable on the barrel with a normal position closely adjacent the muzzle and retractable rearwardly therefrom, wherein,

the barrel is provided with ports adjacent the muzzle thereof capable of releasing explosion gases from the barrel in mutual counteracting effect, independently of the emergence of the gases from the muzzle,

the shroud has ports aligned with the ports in the barrel,

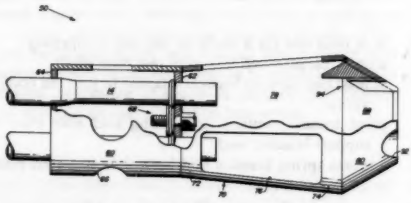
the ports in the barrel are positioned at the sides of the barrel, diametrically opposite each other, at the uniform diameter portion of the bare and adjacent to the muzzle of the barrel, and

the ports in the shroud are in the form of slots elongated longitudinally of the barrel whereby to provide registration with the side ports throughout the retracting movement of the shroud.

4,534,265
SABOT DIVERTER

Jack Bates, Ridgecrest, and Arthur E. Clayson, Inyokern, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 29, 1983, Ser. No. 537,212
Int. Cl.[3] F41F *17/12*
U.S. Cl. 89—14.6 6 Claims



1. A fragment diverter for attachment to the muzzle end of a platform carried gun system having at least one firing gun barrel, for altering, in a directionally controlled manner, the trajectory of selected sabot fragments discarded from fired discarding sabot type projectiles, which comprises:

a mounting section, said mounting section configured for rigid attachment to said muzzle end of said gun system;

an extender cage, said extender cage attached to said mounting section and defining an expansion chamber through which all components of said discarding sabot projectiles, including said discarded sabot fragments, travel unimpeded;

a deflector section, said deflector section being a hollow, open ended frustrum defining a fragment control chamber, said deflector section having a base portion, a neck portion and a wall, said base portion of said deflector section attached to said extender cage and one face of said deflector section wall forming a fragment deflecting surface, said deflector section wall defining a cutout opening into said neck portion of said deflector section, said cutout aligned with said gun barrel from which said discarding sabot type projectiles are fired, said deflecting surface being for the purpose of intercepting and altering the trajectory of a selected portion of said separated sabot fragments, said selected portion of separated fragments being those fragments having trajectories which if unaltered would result in direct fragment impact with said firing platform; and

a cutter-dam, said cutter-dam mounted in said deflector section to split directly impacting fragments for further interaction with said deflecting surface and to prevent said sabot fragments having trajectories altered by said deflecting surface from entering the line of fire of said firing gun barrel of said gun system.

4,534,266

COMPOSITE ARMOUR PLATING

Roger Huet, Grenoble, France, assignor to Aluminum Company of America, Pittsburgh, Pa.

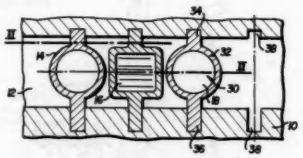
PCT No. PCT/FR79/00020, § 371 Date Nov. 8, 1979, § 102(e) Date Oct. 17, 1979, PCT Pub. No. WO79/00725, PCT Pub. Date Oct. 4, 1979

PCT Filed Mar. 6, 1979, Ser. No. 187,843

Claims priority, application France, Mar. 8, 1978, 78 07538

Int. Cl.[3] F41H *5/04;* B22D *19/02*

U.S. Cl. 89—36.02 4 Claims



1. A composite cast metal armour plating comprising:

a metal panel, and

a plurality of individual ceramic inserts embedded in said panel and regularly arranged in a predetermined, ballistically efficient network, wherein each of said ceramic inserts includes a surrounding metal shell which is provided with at least one protrusion which is linkable with the shell of an adjacent ceramic insert to maintain said inserts in said predetermined network during casting.

4,534,267

SELF-PROPELLED ARMORED VEHICLE

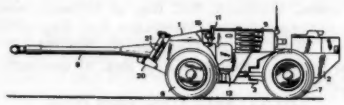
Roger Fagel, Avenue Forestiere, 102, Marcinelle, Belgium

Filed Jun. 28, 1977, Ser. No. 811,899

Claims priority, application Belgium, Jun. 29, 1976, 0168413

Int. Cl.[2] F41H *7/02*

U.S. Cl. 89—40.03 3 Claims



1. A self propelled articulated armored vehicle comprising:

a forward casemate,

an after caisson,

said forward casemate and said after caisson being joined, one with the other, around a vertical pivot axis,

said forward casemate being supported by at least one train of driving wheels,

said after caisson being supported by at least one train of driving wheels,

said forward casemate having means for accommodating at least one weapon, ammunition, equipment to maneuver the vehicle and to sight the weapon, and the crew,

said after caisson having means for accommodating the vehicle's power package for energizing said driving wheels,

said driving wheels being mounted on a variable-height suspension,

means acting symmetrically for linking said forward casemate to said after caisson to determine the relative horizontal angular position of said forward casemate with respect to said after caisson,

and means for varying the variable height suspension of said driving wheels supporting said forward casemate and said after caisson to determine the relative height of said forward casemate and said after caisson with respect to the ground.

4,534,268

HYDRAULIC FLUID CIRCUIT OF HYDRAULIC SHOVEL

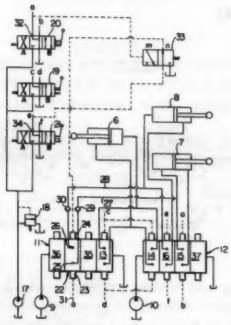
Takashi Yagyu, Ibaraki; Takeshi Yamaguchi, Tsuchiura; Sotaro Tanaka, and Yasuo Sakaki, both of Ibaraki, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1982, Ser. No. 396,878

Claims priority, application Japan, Jul. 10, 1981, 56-101830[U]

Int. Cl.[3] F15B *11/16*

U.S. Cl. 91—6 3 Claims



1. A hydraulic fluid circuit for a hydraulic shovel, the hydraulic fluid circuit comprising:

a first hydraulic pump,

a second hydraulic pump,

a first directional control valve group connected to said first hydraulic pump including a first directional control valve connected to a first hydraulic cylinder, and a second directional control valve connected to a second hydraulic cylinder,

a second directional control valve group connected to said second hydraulic pump including a third directional control valve having a first working port connected to one cylinder chamber of said first hydraulic cylinder and a second working port connected to one cylinder chamber of said second hydraulic cylinder, and

a first pilot line means for introducing a first pilot pressure to said first directional control valve so as to switch said first directional control valve to a position in which hydraulic fluid from said first hydraulic pump is supplied to said one cylinder chamber of said first hydraulic cylinder and for introducing the first pilot pressure to a first pilot port for switching said third directional control valve to a first position in which hydraulic fluid from said second hydraulic pump is supplied to said first working port,

a second pilot line means for introducing a second pilot pressure to said second directional control valve so as to switch said second directional control valve to a position in which hydraulic fluid from said first hydraulic pump is supplied to said one cylinder chamber of said second hydraulic cylinder and for introducing the second pilot pressure to a second pilot port for switching said third directional control valve to a second position in which working fluid from said second hydraulic pump is supplied to said second working port, and

a change-over valve means mounted in a line of said second pilot line means, said first pilot line means including a pilot line actuating said change-over valve means such that, when said first pilot pressure is not generated, said

change-over valve means introduces said second pilot pressure to the second pilot port of said third directional control valve by communicating said line of said second pilot line means with said third directional control valve, and, when said first pilot pressure is generated, said pilot line means is operable to actuate said change-over valve means to a position blocking said line of said second pilot line means and communicating said second pilot port to a tank.

4,534,269

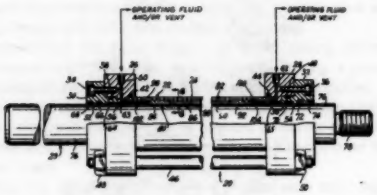
LOCKING, BEARING AND ACTUATING APPARATUS

Joseph E. Scerbo, and Roy B. Johnson, both of York, Pa., assignors to York Industries, Inc., York, Pa.

Filed Nov. 16, 1981, Ser. No. 333,249

Int. Cl.³ F15B *15/26*

U.S. Cl. 91—41 **25 Claims**



1. In locking and bearing apparatus which include a generally tubular outer element, a generally cylindrical inner element disposed at least in part within said outer element and dimensiond relative thereto to provide an operating space therebetween, and means restricting said operating space against the loss of pressurized fluid therefrom, the improvements comprising, an intermediate element disposed in said operating space and including fluid passages formed therein in communication with said operating space for fluid distribution through said operating space, said intermediate element being dimensioned relative to said operating space to form interference fits with said outer and inner elements to lock the same together and prevent relative movement therebetween, said outer element being expandable within the elastic limit thereof by fluid pressure in said operating space to release said interference fits, and means to introduce pressurized fluid into said operating space whereby, the introduction to said operating space of fluid pressurized to a level effective to expand said outer element within the elastic limit thereof to an extent sufficient to release said interference fits will be operable to release the lock between said outer and inner elements and enable relative movement therebetween, and whereby the subsequent depressurization of said fluid below said level will be operable to reinstitute said interference fits and re-lock said outer and inner elements against relative movement.

4,534,270

VACUUM BOOSTER ASSEMBLY

Michiharu Nishii, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 16, 1983, Ser. No. 552,467

Claims priority, application Japan, Dec. 1, 1982, 57-182925[U]; Dec. 2, 1982, 57-182919[U]

Int. Cl.³ F01B *19/00*; F16J *3/02*

U.S. Cl. 91—376 R **5 Claims**

1. A vacuum booster assembly, comprising:

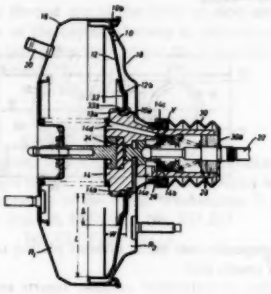
a housing,

a piston body axially movable in said housing,

a diaphragm member having an inner peripheral bead coupled over said piston body and an outer peripheral bead secured to the inner wall of said housing, said diaphragm member being arranged to subdivide the interior of said housing into a negative pressure chamber and a variable pressure chamber,

valve means cooperable with said piston body for selectively communicating said variable pressure chamber with said negative pressure chamber or the atmospheric air,

an annular support plate attached to one face of said diaphragm member in said negative pressure chamber and having an inner cylindrical portion coupled with the inner peripheral bead of said diaphragm member to fasten the



same to said piston body in an air-tight manner, wherein said annular support plate is made of thin sheet metal and formed at its radially inward circumference with an annularly pressed portion, and an annular reinforcement plate of thick sheet metal integrally secured to the annularly pressed portion of said support plate and located in said negative pressure chamber, said reinforcement plate being extended radially outwardly in a predetermined radius over the annularly pressed portion to prevent flexure of the outer peripheral portion of said support plate.

4,534,271

DUAL MACHINE AGGREGATES WITH A CONNECTION FOR A CONSUMER OF MECHANICAL ENERGY

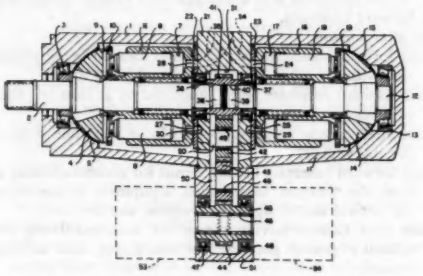
Franz Forster, Muhlbach, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 508,793

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225464

Int. Cl.³ F01B *13/04*; F04B *23/04*

U.S. Cl. 91—472 **14 Claims**



1. In a two-machine aggregate with two hydrostatic piston machines arranged coaxially to each other with a common intermediate control bottom between them, having a common shaft, a free shaft connection for connecting another consumer of mechanical energy spaced from said common shaft, the improvement comprising a torque transfer unit connected with the said common shaft between the two machines and extend-

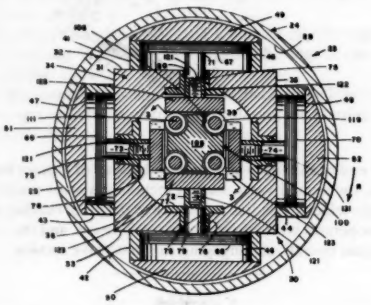
ing through the common intermediate control bottom, the free shaft connection being located on an auxiliary shaft parallel to said common shaft of the two machines and said torque transfer unit being connected with this auxiliary shaft.

4,534,272

LOW INERTIA AND LOW FRICTION ROTATING CYLINDER ENGINE

Everett F. Irwin, Dunedin, Fla., assignor to Dynacycle Corporation, Dunedin, Fla.

Filed Nov. 30, 1984, Ser. No. 676,880
Int. Cl.[3] F01B *13/06;* F16H *25/08*
U.S. Cl. 91—493 8 Claims



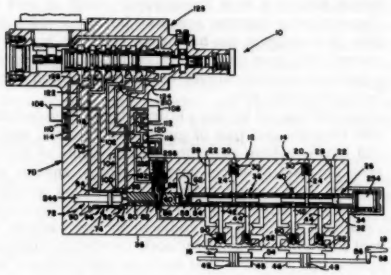
1. An engine comprising,
a housing having a central axis,
a cylinder block rotatably mounted in said housing for rotation coaxially with said housing axis,
said cylinder block having an axially extending opening therein,
an output shaft having an inner end disposed in said axially extending opening and an outer end extending axially from said housing,
said output shaft having an axis of rotation disposed eccentrically with respect to the axis of rotation of said cylinder block,
at least a first and a second pair of diametrically opposed generally radially extending piston-receiving cylinders disposed in said cylinder block with said first pair being circumferentially and equidistantly spaced from said second pair,
a piston slideably and sealingly mounted in each of said piston cylinders,
abutment means carried by the radially inner ends of said pistons,
a pair of piston joining members in the form of a pair of bridle rings secured to the abutment means of each pair of diametrically opposed pistons for insuring that the pistons disposed in each pair of cylinders reciprocate in unison,
a square cam means carried by said output shaft and rotatable unitarily therewith and disposed at a location intermediate said pistons,
axially extending roller means carried by said cam means and engaged by the abutment means on the inner end of said pistons,
said roller means being partially disposed below the surface of said cam means so as to only partially extend therefrom and including axially extending maintaining means mounting said roller means for rotation and preventing other movement of said roller means,
and there being four of said roller means mounted for rotation in semicircular grooves in corner portions of said square cam,
whereby a compact and low inertia structure is obtained,
and spaced first intake and exhaust ports positioned to be alternately confluent with the outer ends of said pistons for alternately charging and exhausting the area outwardly of said piston and imposing a load upon said cam means for causing rotation of said output shaft and said cylinder block.

4,534,273

CONTROL ACTUATION SYSTEM INCLUDING STAGED DIRECT DRIVE VALVE WITH FAULT CONTROL

Robert D. Vanderlaan, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Continuation of Ser. No. 463,631, Feb. 3, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 680,231
Int. Cl.[3] F15B *11/00*
U.S. Cl. 91—510 28 Claims



1. A control actuation system useful in a dual hydraulic servo actuator control system for operating a relatively long stroke, control valve element therein, comprising an actuator, a tandem piston axially movable in said actuator and drivingly connectable to the control valve element, staged valve means operatively connected to said actuator for effecting axial movement of said piston in opposite directions, and control input means including force motor means for linearly driving said staged valve means through a relatively short stroke in relation to the stroke of said piston to effect position control of said piston, said piston including two serially connected piston sections each having axially opposed pressure surfaces, and said staged valve means including a valve plunger having two serially connected valving sections respectively for controlling the differential application of fluid pressure from respective sources thereof on said opposed pressure surfaces of respective said piston sections to cause axial movement of said piston in opposite directions in response to relatively short, directly driven linear movement of said valve plunger in opposite directions, a fault control valve member axially movable in said staged valve means, and means responsive to fluid pressure from either source thereof being supplied to said staged valve means for moving said fault control valve member from a disabling position blocking the differential application of fluid pressure to said piston by said valve plunger to an enabling position permitting such application and release of fluid pressure.

4,534,274

PISTON ASSEMBLY FOR INTERNAL COMBUSTION ENGINES

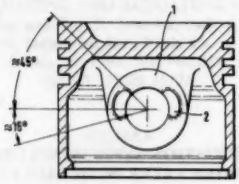
Emil Ripberger, Remseck, and Gotthard Stuska, Fellbach, both of Fed. Rep. of Germany, assignors to Mahle GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,681

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1982, 3211472

Int. Cl.³ F16J 1/02, 1/16

U.S. Cl. 92—187 **2 Claims**



1. A piston assembly for internal combustion engines, comprising

(a) a piston having a crown and skirt, said piston having a longitudinal axis;

(b) a pair of gudgeon pin bosses within said skirt, each of said bosses having a bore therethrough, each of said bores disposed on a common axis, said bores coaxially receivable of a gudgeon pin having an axis, said bosses being spaced apart from one another, each of said bosses having a gudgeon pin boss surface disposed about said bore and facing the other boss;

(c) a connecting rod having a little end, said little end receivable between said pair of gudgeon pin bosses, said little end having a bore therethrough receivable of said gudgeon pin, said little end having a pair of annular planar surfaces, each annular planar surface facing toward and spaced apart from a respective gudgeon pin boss surface;

(d) abutment means on said gudgeon pin boss surfaces, adjacent said annular planar surfaces, for sliding engagement against said annular planar surfaces, said abutment means comprising a pair of raised planar sliding surfaces on each of said gudgeon pin boss surfaces protruding in the direction of said common axis of the bores, said pair of raised planar surfaces being disposed one on each side of a central vertical plane containing said longitudinal axis and said common axis, said pair of raised planar surfaces each intersecting a horizontal plane containing said common axis, each of said pair of raised planar surfaces extending over an angular dimension, about said common axis, of about 45° above said horizontal plane and about 15° below said horizontal plane.

4,534,275

AIR DISCHARGE INSTALLATION FOR THE AIR FEED INTO THE INTERIOR SPACE OF A VEHICLE

Peter Hofmann, Weissach, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

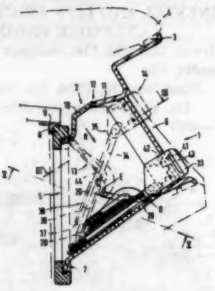
Filed Nov. 29, 1983, Ser. No. 556,121

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1982, 3244729

Int. Cl.³ B60H 1/24

U.S. Cl. 98—2 **18 Claims**

1. An air discharge installation for controlling air supplied into an interior space of a vehicle, comprising an air-regulating element connected with an actuating means arranged in a housing means within the area of an air inlet opening, the air-regulating element including a plurality of valve sections pivotally connected with each other, said plurality of valve sections being operable to be moved from a folded-together open position in which the plurality of valve sections are disposed substantially one above the other, by way of intermediate positions into an unfolded closing position, a first valve section of said plurality of valve sections being rotatably supported at one end at the housing means and a second valve section of said plurality of valve sections being connected with



a free end of the first valve section by way of a pivot bearing means, the second valve section including a lever means having a pin which extends at a distance to the pivot bearing means and cooperates with a fixed guide track means, and the actuating means operatively engaging the first valve section.

4,534,276

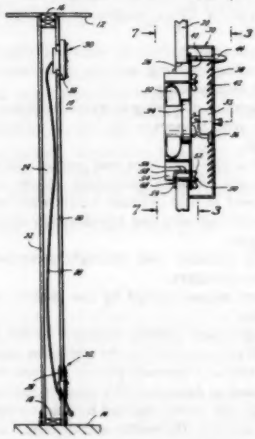
ROOM HEAT CIRCULATION SYSTEM

Arlie E. Allison, P.O. Box 7445, Beaumont, Tex. 77706

Filed Oct. 26, 1984, Ser. No. 665,313

Int. Cl.³ F24F 7/06

U.S. Cl. 98—34.5 **4 Claims**



1. A room heat circulation system for circulating warm air from the top of a room to the bottom of the room using a wall of the room as a duct comprising,

a fan and upper grill connected to a housing and said housing adapted to be inserted in an upper opening in said wall, said grill having upwardly directed louvers for drawing in warm air by the fan from the top of the room,

said housing having a plurality of slots directed radially outwardly towards the edge of said upper opening when the housing is inserted therein,

a plurality of L-shaped clips positioned on the back of the housing, each clip having a threaded bolt extending through one of the slots whereby the clips may be retracted in the slot for inserting the housing into the upper

opening and may then be extended to engage the edge of the upper opening,

a nut for attachment to the each threaded bolt for securing the housing in the upper opening,

a bottom grill adapted to be inserted in a lower opening in the wall, said grill having downwardly directed louvers for exhausting warm air from the wall duct to the bottom of the room,

a retainer bar positioned on the back of the bottom grill and pivotably connected thereby by a rotatable knob on the front of the grill whereby the bar may be rotated out of the way for inserting the bottom grill into the bottom opening and then rotated into engagement with the edge of the bottom opening for securing the bottom grill in the lower opening,

clip guides on each side of each L-shaped clip for maintaining the clip in position for engaging the edge of the upper opening, and

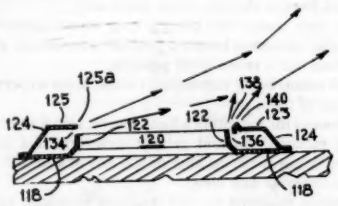
said clip guides are positioned on the back of the housing and extend radially outwardly for centering the housing in the upper opening.

4,534,277

GEOMETRIC AIR PROJECTION AND CONTAINMENT

Richard H. Gillmor, 7140 Greenforest Dr., Portage, Mich. 49081, assignor to Richard H. Gillmor, Portage and Benjamin W. Wise, Richland, both of, Mich.

Filed Aug. 18, 1983, Ser. No. 524,441
Int. Cl.³ F24F 9/00
U.S. Cl. 98—36 **9 Claims**



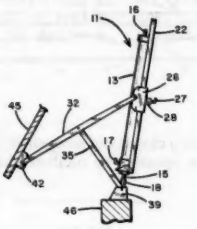
1. A process for producing a geometric air projection and containment space tented over an area open to ambient atmosphere, which comprises directing a plurality of substantially contiguous sheets of air outwardly from around said area into said ambient atmosphere and toward a common apex in an axis which projects obliquely from the center of said open area, said contiguous sheets intersecting at said common apex to form a tent-shaped containment space comprised within a pointed geometric figure, the apex of which is the confluence of said sheets, the walls of said containment space consisting of said sheets of air sufficiently intact to prevent or minimize passage of gaseous material into said containment space except through said open area, any air or other gaseous material aspirated into said containment space commingling with the air in said containment space and being vented through said confluence along with the air sheeted through said confluence, and said sheets converging at an angle such that flow is induced into said containment space sufficient to prevent back-flow through said open area, in which said apex is sufficiently to one side that substantially none of said contiguous sheets, or the confluence thereof, impinges on a person in front of said open area.

4,534,278

LIVESTOCK CONFINEMENT BUILDING WALL-VENT CONTROLLER

Rodney L. Spilde, 6300 W. Richmond Rd., Aberdeen, S. Dak. 57401

Filed Jun. 9, 1983, Ser. No. 502,691
Int. Cl.³ F24F 7/00
U.S. Cl. 98—37 **3 Claims**



3. A wall-vent closer comprising:

(a) a pneumatic assembly having a means for extending a piston upon connection of the pneumatic assembly to a source of compressed air and a means for retraction of the same piston upon connection of the pneumatic assembly to another source of compressed air;

(b) a frame having a cylinder mount member and a slotted member, the cylinder mount member having an aperture through which the piston of the pneumatic assembly extends, the cylinder being fixedly mounted to the cylinder mount member, and the slotted member being affixed to the cylinder mount member and extending parallel with the cylinder, the slotted member having a plurality of spaced slots along its longitudinal center line;

(c) a sill mount pivotally mounted on the free end of the piston so that upon attachment of the sill mount to a sill the frame and pneumatic assembly travels away from or towards the sill mount when a first and second source of compressed air are alternatively connected to the pneumatic assembly;

(d) an arm having one end pivotally mounted on an adjustable slide, the slide being slidably mounted on the slotted frame member;

(e) a latching means to arrest the slidable movement of the adjustable slide along the slotted frame member at a slot along the longitudinal centerline of the slotted frame member;

(f) a wall-vent mount pivotally mounted on the other end of the arm; and

(g) a fulcrum extending between the sill mount and a point between the ends of the arm, both ends of the fulcrum being pivotally mounted; so that when a first source of compressed air is connected to the pneumatic assembly, a wall-vent which is connected to the wall-vent mount will open and when a second source of compressed air is connected to the pneumatic assembly the wall-vent will close within a predetermined range of travel as determined by the point at which the adjustable slide is latched into the slotted frame member.

4,534,279

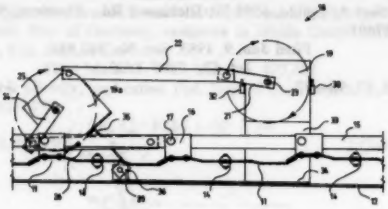
AIR DIRECTING APPARATUS

Raymond S. Cardiff, 40 Carnaby St., Macgregor, 4109 Queensland, Australia

Filed Oct. 24, 1983, Ser. No. 544,899
Claims priority, application Australia, Oct. 22, 1982, PF6476
Int. Cl.³ F24F 13/16
U.S. Cl. 98—40.18 **5 Claims**

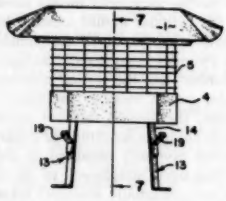
1. An outlet assembly for an air supply means including air deflector means comprising a louvre assembly having a plural-

ity of louvre blades positionable to deflect air from the air supply means; selectively operable closure means for moving



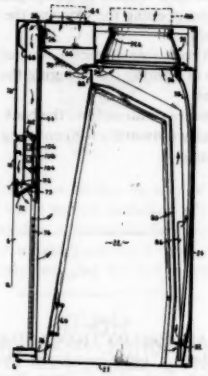
the blades between a closed and an open air deflecting position; and, drive means operable to oscillate the blades about the open position.

4,534,280
CHIMNEY CAP
Durward A. Hisey, St. Louis, Mo., assignor to Hy-C Company, Inc., St. Louis, Mo.
Division of Ser. No. 357,733, Mar. 12, 1982, Pat. No. 4,436,021. This application Oct. 25, 1983, Ser. No. 545,229
Int. Cl.³ F23J *13/08*
U.S. Cl. 98—67 **3 Claims**



1. In a chimney cap for use in providing coverage for the upper end of the formed chimney flue and thereby preventing the entrance of any extraneous elements therein, comprising, a cover means provided upwardly of the cap and preventing the entrance of rain or elements downwardly into the chimney flue, a band means arranged downwardly of the cap and designed for proximity fitting upon the said chimney flue, said cover means and band means being spaced apart a distance heightwise to allow sufficient draft to develop and remove smoke and fumes from the chimney flue, a foraminous means arranged connecting with both said cover means and band means and disposed spanning the space between the said means and arranged substantially in alignment with the said band means, and retention means operatively associated with the said band means for assuring its securement with the chimney flue upon which it seats, said retention means including a series of appendages securing with the band means and projecting downwardly therefrom for extending into and biasing against the interior of the chimney flue for securement of the cap therewith, said band means being formed having a series of sides, adjacent sides of the band means being intervened by substantially flattened corners, there being an appendage connecting at each corner of the band means, each appendage being formed of resilient material, and each appendage including a leg that connects with the band means, being arranged contiguously with the interior of the band means, at each corner thereof, and extends inwardly and then downwardly to its lowest extent, each said appendage end arranged for biasing against the interior of the chimney flue for securing said cap firmly in place, with the inwardly extending portion of the leg of each appendage functioning as a shoulder means for contacting with the upper edge of the chimney flue to limit the extent of insertion of the chimney flue with the band means during installation of the said chimney cap.

4,534,281
LABORATORY FUME HOOD
James D. Parks, Johnson County, Kans.; Charles A. Moss, Jackson County, Mo., and Kermit W. Dyer, Johnson County, Kans., assignors to Labconco Corporation, Kansas City, Mo.
Filed Sep. 26, 1983, Ser. No. 535,639
Int. Cl.³ F23J *11/00*
U.S. Cl. 98—115.3 **16 Claims**



14. A fume hood comprising:
cabinet structure presenting an enclosed work area and an access opening to said area, said cabinet structure having a hood liner at the top of the work area;
vertical sash means for closing said access opening and movable between a lowered position wherein the opening is closed and a raised open position,
said sash means being substantially transparent to permit the passage of light;
fixture means for mounting a light source, said fixture means being mounted on said cabinet structure at a location spaced below the hood liner on the side of said sash means that is opposite said area;
cover means mounted on said structure in spaced relationship to said sash means and said fixture means,
said cover means being removable to provide access to said fixture means from the inside thereof when said sash means is in the lowered position.

4,534,282
PROCESS AND APPARATUS FOR TREATING FOOD PRODUCTS
René A. Marinoza, 8220 - 8th Ave., St. Francois, Quebec, Canada (H7A 1H1)
Filed May 4, 1982, Ser. No. 374,906
Int. Cl.³ A23C *3/00*
U.S. Cl. 99—451 **6 Claims**

1. An apparatus for sterilizing flowable food products, comprising an elongated cell including a radiation-emitting elongated member, end cell bodies supporting the ends of said

member, a first quartz tube spacedly surrounding said member, said first quartz tube being transparent to said radiation, a second tube spacedly surrounding said first tube and defining a circulation space with said first tube, said second tube being opaque and reflective to said radiation, said first and second tubes being supported by said end cell bodies in fluid-tight engagement therewith, said end cells bodies each defining a first chamber in communication with said space and having a port for a flowable food product circulating through said space and a second chamber isolated from said circulation space, openable from the outside of said cell and providing an access into said first quartz tube to extract said radiation-emitting elongated member without disturbing the flow of food products through said cell.

4,534,283

METHOD AND APPARATUS FOR MANUFACTURING BEAN CURD

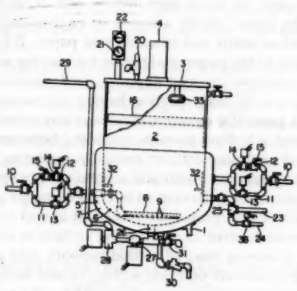
Masamichi Nakamuta, 320, Arii, Shonai-machi, Kaho County, Fukuoka Prefectur, Japan

Filed May 2, 1983, Ser. No. 490,800

Claims priority, application Japan, May 6, 1982, 57-77364; May 7, 1982, 57-67104[U]

Int. Cl.³ A23J *1/00*

U.S. Cl. 99—468 **11 Claims**



1. An apparatus for heating a bean curd slurry in preparing tofu, comprising a vessel to contain therein said bean curd slurry to be heated, an outer wall substantially sealingly surrounding said vessel with a space being left therebetween to form a heating chamber, a first steam supply means mounted within said vessel for direct introduction of steam into said slurry, a second steam supply means connected to said heating chamber for indirectly heating said slurry, steam control means providing for two stage heating of said slurry under boiling conditions in the first stage and reduced heat steaming in the second stage, said control means including (i) a first heat supply regulating means adapted to regulate the amount of steam to be fed to said first steam supply means, and (ii) a second heat supply regulating means adapted to regulate the amount of steam to be fed to said second steam supply means, and a supply means for said slurry to feed the same into said vessel for said two stage heating.

4,534,284

HIGH SPEED EGG BREAKING APPARATUS

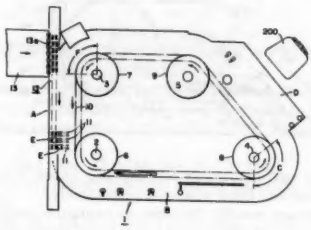
Gen Fujimura; Koichi Sotoma, both of Tokyo; Hiroshi Kunikyo; Masahito Hata, both of Yokohama, and Hidesuke Inoue, Tokyo, all of Japan, assignors to Kewpie Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 486,487, Apr. 19, 1983, abandoned. This application May 11, 1983, Ser. No. 493,576

Claims priority, application Japan, Apr. 21, 1982, 57-65251; May 11, 1982, 57-78747; Jun. 12, 1982, 57-100981; Jun. 20, 1982, 57-110047; Aug. 18, 1982, 57-124087

Int. Cl.³ A23J *1/09*; A47J *43/14*

U.S. Cl. 99—498 **18 Claims**



1. A high-speed egg-breaking apparatus comprising:

(a) an infeed conveyor for transporting a multiplicity of shell eggs in transverse rows;

(b) a transfer conveyor for receiving the shell eggs from the infeed conveyor, the transfer conveyor being arranged at a right angle with the infeed conveyor, whereby the successive transverse rows of shell eggs on the infeed conveyor can be rearranged into a longitudinal row on the transfer conveyor;

(c) a breaker conveyor traveling endlessly along a predetermined path including a linear portion extending along the transfer conveyor, the transfer conveyor being linearly arranged along the forward end of the infeed conveyor and the linear portion of the breaker conveyor, the transfer conveyor and the linear portion of the breaker conveyor being moved in the same direction and at the same speed;

(d) a plurality of egg breaker assemblies carried at longitudinal spacings by the breaker conveyor for receiving the shell eggs from the transfer conveyor while traveling along the same and for breaking the received shell eggs; and

(e) a plurality of recovery cup assemblies also carried by the breaker conveyor and underlying the respective egg breaker assemblies for receiving the white and yolk from the broken shell eggs.

4,534,285

ACTUATOR MECHANISM FOR CONTINUOUS ROLL BALING MACHINE

Kenneth R. Underhill, Strasburg, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Nov. 29, 1983, Ser. No. 556,222

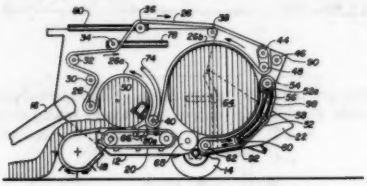
Int. Cl.³ B30B *5/06*

U.S. Cl. 100—88 **3 Claims**

1. In a roll baling machine having lower bale forming means, a first upper bale forming means cooperating with said lower bale forming means to define a first bale forming chamber, a second upper bale forming means cooperating with said first upper bale forming means to define a second bale forming chamber;

arm means movable into a lower position for moving said first upper bale forming means into a first position where material is prevented from entering said second bale forming chamber, said arm means movable into an upper posi-

tion for moving said first upper bale forming means into a second position where a roll bale may be transferred from said first to said second bale forming chamber, and said arm movable into an intermediate position for moving said first upper bale forming means into a third position where material is allowed to enter said second bale forming chamber while a roll bale is maintained in said second bale forming chamber by said first upper bale forming means; said arm means carrying guide members engaging said first upper bale forming means, said arm means being positioned in said lower, upper and intermediate positions



when said first upper bale forming means is in said first, second and third positions, respectively,

ramp means movable between an operative position extending upwardly above said lower bale forming means and an inoperative position;

the improvement comprising actuator means interconnecting said arm means and said ramp means causing movement of said ramp means to the operative position when said arm means moves to said lower position, and said actuator means also causing movement of said ramp means to the inoperative position when said arm means moves to said upper and intermediate positions.

4,534,286

HAM MOLD CLOSING APPARATUS

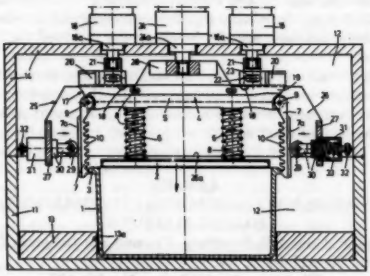
Jürgen Franzke, Bad Essen, Fed. Rep. of Germany, assignor to Roscherwerke GmbH, Osnabruck, Fed. Rep. of Germany

Filed Dec. 23, 1983, Ser. No. 564,994

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 8332147[U]

Int. Cl.³ B30B *1/34*

U.S. Cl. 100—219 **9 Claims**



1. In a ham mold closing apparatus having a vacuumizable chamber in which at least one two-part mold consisting of a container having a retaining rim and a cover that fits loosely into it is positioned and means for moving the cover, in relation to the container to compress a ham that has been placed in the mold including a compression bridge having a strut, compression springs, and securing arms coactive with the rim and at least one compression-medium cylinder connected to the compression bridge and that is positioned on one wall of the chamber one into the other, the improvement wherein the moving means further comprises two compression-medium cylinders, a compression beam connected thereto to be raised and lowered by the two pressure-medium cylinders and having two points of compression positioned at a distance along the compression-bridge strut and operating in conjunction with the compression bridge to move the cover in relation to the container.

4,534,287

DOT MATRIX PRINT HEAD

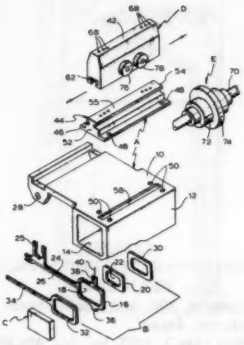
Robert A. Meloni, Baltimore, Md., assignor to General Instrument Corp., Clifton, N.J.

Continuation of Ser. No. 485,749, Apr. 18, 1983, abandoned.

This application Jan. 10, 1985, Ser. No. 690,416

Int. Cl.³ B41J *3/12*

U.S. Cl. 101—93.05 **1 Claim**



1. A head for printing a dot on a paper comprising a support, a print wire having an impact end, an actuator operably connected to said support, active on said print wire, and effective, when actuated, to move said impact end of said print wire towards the paper, means adapted to engage said print wire beyond said actuator and towards said paper, for positioning same relative to the paper, and means for moving said positioning means relative to said support, said positioning means comprising a solid body portion having first and second surfaces and a generally cylindrical passageway extending therebetween, and a hollow portion extending between said body portion and said support for movably mounting said body portion on said support with said second surface spaced therefrom, said passageway having an internal diameter greater than the diameter of said print wire to permit lateral movement of said print wire relative to said second surface as said positioning means is moved relative to said support, said passageway terminating proximate said first surface of said body portion in an impact end receiving opening with a diameter slightly greater than the diameter of said print wire so as to prevent substantial relative lateral movement between said impact end and said first surface of said body portion.

4,534,288

METHOD AND APPARATUS FOR REGISTERING OVERLAPPING PRINTED IMAGES

Yakov Z. Brovman, Mystic, Conn., assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed May 6, 1982, Ser. No. 375,374

Int. Cl.³ B41F *5/06, 5/16*

U.S. Cl. 101—211 **16 Claims**

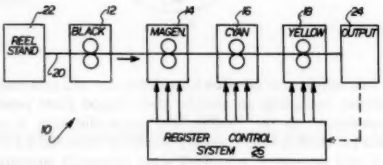
1. A method of indicating misregister between two overlapped images, comprising the steps of:

forming a first plurality of spaced lines of equal width in a first indicia area occupying a known position relative to one of said two overlapped images, said lines being transversely spaced apart by an amount which is small relative

to the lengths of said lines and is substantially the same as the width of said lines and being substantially straight and disposed substantially parallel to one another,

forming a second plurality of spaced lines in a second indicia area occupying a known position relative to the other of said overlapped images, said second plurality of lines being spaced apart by an amount which is small relative to the lengths of said lines and being substantially straight and oriented substantially parallel to one another and to said first plurality of lines such that when said first and second areas overlap one another the extent to which said lines of said first and second areas overlap one another changes with displacement between said two indicia areas in a direction transverse to said lines, said known position relative to the other of said overlapped images being selected so that when said overlapping images are in register said first and second indicia areas overlap,

wherein said step of forming said second plurality of lines comprises the step of forming said lines to have substantially the same width and spacing as said first plurality of straight lines and in a location relative to said other of said overlapped images such that when said overlapped images are in register said second plurality of lines is displaced relative to said first plurality of lines by a fraction of the thickness of said lines, whereby misregister of said overlapped images in a first direction causes said first and second plurality of lines to overlap to a greater extent and misregister in an opposite direction causes said first and second plurality of lines to overlap to a lesser extent,



illuminating the area of overlap of said first and second indicia areas,

detecting light returned from at least a significant portion of said first area of overlap and providing a first signal in accordance therewith, said signal having a value indicative of the amount of light returned from the entire said portion and thus representing the extent of overlap of said lines of said first and second indicia areas, and

utilizing said signal value as a measure of misregister of said overlapping images.

4,534,289

COOLING ROLLER WITH DIFFERENT PRESELECTED COOLING ZONES

Klaus Dürrnagel, Eppelheim; Willi Jeschke, Heidelberg, and Hans-Georg Jahn, Wiesenbach, all of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

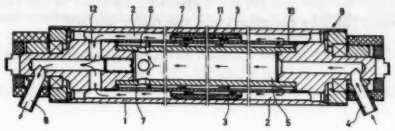
Filed Nov. 14, 1983, Ser. No. 551,099

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242066

Int. Cl.[3] **B21B** *27/06;* **B41F** *31/26;* **F28D** *11/02*

U.S. Cl. 101—348 **8 Claims**

1. Printing-Press roller traversed by a temperature-regulating medium and having jacket-like partitions in the interior thereof surrounded by an outer circumferential wall, comprising means located at one axial end of the outer circumferential wall for introducing the temperature regulating medium into the interior of the roller, means for conducting the temperature-regulating medium in a circuitous path through the interior of the roller, means located at the other axial end of the outer circumferential wall for discharging the temperature-regulating medium from the interior of the roller; and at least one heat-insulating element disposed in a middle region of the circumferential roller wall, said element forming an impedi-



ment to a transfer of heat on the surface of the circumferential roller wall in longitudinal direction thereof.

4,534,290

INK FILM DISPENSING SYSTEM FOR A PRINTING PRESS

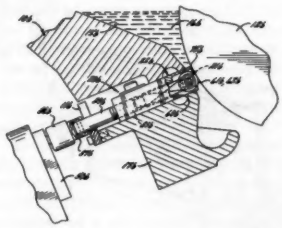
Peter Schroder; Fred Kunkel, and Peter Hummel, all of Offenbach am Main, Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,590

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311113

Int. Cl.[3] **B41F** *31/04, 31/06;* **B41L** *27/06*

U.S. Cl. 101—365 **14 Claims**



1. In an ink dispensing system for a printing press, the combination comprising a frame, a slowly rotated fountain roller, an ink trough on the frame extending the length of the fountain roller for containing a body of ink, a trough base member extending parallel to the trough and defining with the trough a working space of constant thickness, a plurality of radially oriented ink spreader assemblies arranged closely side-by-side in the working space individually slidable and together forming a substantially continuous metering edge for zonal metering of a film of ink on the fountain roller as it rotates, each spreader assembly including a bearing member and a dispensing member, the bearing member having a presented tip of narrow dimension and the dispensing member having a presented film-forming edge, means for biasing the bearing member so that its tip rides in contact with the surface of the roller to establish a positional reference for adjustment of the dispensing member, an adjusting screw mounted on the bearing member and engaging the dispensing member, means for turning the adjusting screw so that the dispensing member is retracted a small running distance rearwardly of the tip of the bearing member thereby to determine the zonal thickness of the ink film formed on the surface of the roller by the dispensing member, the film-forming edge of the dispensing member being sharply abrupt and being faced toward the body of ink so that the ink film is formed by a clean-cut shearing action free of any tendency toward wedging of the ink between the dispensing member and the roller thereby to minimize reaction force of the ink against the dispensing member especially in a radial direction, the biasing means including means reacting against the press frame for applying bias at a level of magnitude which does not substantially exceed that required to overcome sliding

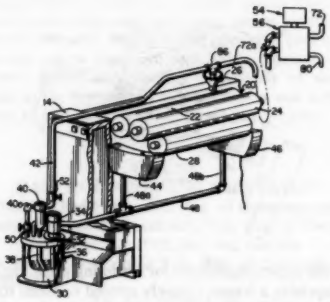
friction of the assembly thereby to minimize the force of the bearing member against the surface of the roller while maintaining (a) the tip of the bearing member constantly seated on the roller surface and (b) the dispensing member at the predetermined running distance from the roller surface.

4,534,291

METHOD AND APPARATUS FOR CLEANING PRINTING PRESSES

James J. Sabota, 15849 Sylvia Dr., Brook Park, Ohio 44142, and William G. Bradshaw, 7340 Martingale, Chesterland, Ohio 44026

Filed Dec. 13, 1979, Ser. No. 103,194
Int. Cl.³ B41F *31/06*; B41L *27/08*
U.S. Cl. 101—426 **28 Claims**



1. A method of washing ink from elements of a printing press having an ink pump adapted to be at least partially submerged in a reservoir of ink and to deliver ink through conduit supply means to a press fountain operable to distribute ink during printing operation, collector pan means for receiving excess ink delivered to the fountain, and conduit return means connected to the collector pan means for removing excess ink therefrom during printing operation comprising a washing operation including;

(a) providing a source of wash liquid under pressure;

(b) disconnecting the ink pump from the reservoir of ink,

(c) flowing a first stream of the wash liquid into the press fountain while operating the printing press to distribute the wash liquid and to collect the wash liquid in the collector pan means for removal through the conduit return means while effecting washing of the elements of the press by contact with the wash liquid;

(d) flowing a second stream of the wash liquid through the conduit supply means to the ink pump and through the ink pump in a countercurrent ink flow direction while operating the ink pump to wash internal surfaces of the conduit supply means and the pump, and

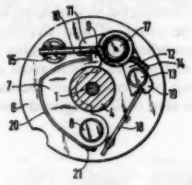
(e) flowing a third stream of the wash liquid to shower head means for spraying the wash liquid onto the external surfaces of the pump which are normally submerged in ink during printing operation and washing the external surfaces by contact with the wash liquid.

4,534,292

SELF-DESTRUCT DEVICE FOR SPIN-STABILIZED PROJECTILE DETONATORS

Adolf Weber, Neunkirchen; Hans Strauss, Reichenschwand, and Hans Pauly, Schwaig, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 562,851
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 8236369[U]
Int. Cl.³ F42C *1/04*
U.S. Cl. 102—241 **4 Claims**



1. In a self-destruct device for a detonator of a spin-stabilized projectile, including an annular disc-shaped plate positioned perpendicular to the longitudinal projectile axis; a spring-loaded percussion sleeve axially slideably mounted on a firing pin of said detonator; a locking lever pivotably supported on said plate and having an initial position engaging the percussion sleeve; a tripping lever pivotably supported on said plate, having first and second arms, and having an initial position where the first arm engages the locking lever to hold the locking lever in its initial position; a flyweight supported on the second arm of the tripping lever; a primary spring urging the second arm of the tripping lever radially inward; and a safety support fastened on the plate and having an initial position engaging the second arm of the tripping lever to limit radially inward movement of said second arm and hold the tripping lever in its initial position; wherein upon rotation of said plate resulting from a firing of the projectile, centrifugal forces cause the flyweight and the second arm of the tripping lever to pivot radially outward against the force of the primary spring and away from the safety support, and the safety support moves radially outward; and then upon a decrease in the rotational speed of the disc, the primary spring forces the second arm of the tripping lever radially inward and the first arm thereof radially outward, away from the locking lever, the locking lever moves away from its initial position, and the percussion sleeve strikes the firing pin; the improvement comprising:

an auxiliary spring supported on the disc and having a free end located adjacent and radially inward of the first arm of the tripping lever, the free end of the auxilary spring moving radially outward and engaging the first arm of the tripping lever to inhibit the second arm of the tripping lever from moving away from the safety support upon impacts on the side of the disc that tend to cause the flyweight to move radially outward.

4,534,293

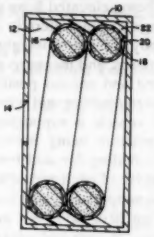
COILED CURVILINEAR SOLID PROPELLANT GRAIN

Ben F. Wilson, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 1, 1984, Ser. No. 667,315
Int. Cl.³ C06D *5/06*
U.S. Cl. 102—289 **7 Claims**

1. A curvilinear solid propellant gas generator comprising a gas generator housing having a chamber defined therein, said gas generator housing and said chamber having a length which is less than the width thereof, a curvilinear solid propellant grain that includes an end burning solid propellant that is encompassed by a liner inhibitor and being mounted as a coiled

curvilinear structure in a fixed position in said gas generator housing to provide said gas generator housing that has a length



that is less than the width thereof to provide a compact gas generator arrangement with a long burning end grain type propellant.

4,534,294

FIN-STABILIZED PROJECTILE WITH PROPELLANT CAGE

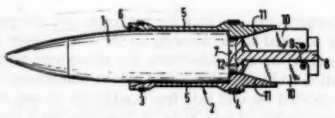
Klaus von Laar, Lauf/Pegnitz; Werner Heberlein, Nuremberg, and Josef Burda, Straubing, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Mar. 16, 1984, Ser. No. 590,213

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309533

Int. Cl.³ F42B *13/16*

U.S. Cl. 102—520 **3 Claims**



1. In a fin-stabilized projectile including a propellant cage encompassing the body of said projectile, said propellant cage consisting of a plurality of segments; means for retaining said segments together; and an annular recess at the leading end of said cage extending along the outer diameter of the propellant cage adapted to initiate the spreading apart of segments subsequent to said projectile exiting from a weapon barrel, and a guide mechanism including pivotable fins on said projectile; the improvement comprising

guide mechanism support means fastened at the trailing end of the projectile body, pivot elements for restraining in a retracted position the fins of said guide mechanism at the trailing end of said support means for the guide mechanism, said propellant cage extending over at least a part of said fins, the fins in the retracted condition thereof having leading edges sloped inwardly and outwardly at an acute angle relative to the longitudinal axis of the projectile, said propellant cage segments each having at their rear ends an internal surface sloping outwardly and rearwardly relative to the leading edges of said fins, and said fins in the region covered by the propellant cage include outer edges extending outwardly and rearwardly relative to the leading edges of the fins and being contiguous with the internal surfaces of the propellant cage segments so as to reach their greatest expanse towards the end of the guide mechanism.

4,534,295

TRACK TAMPING, LEVELING AND LINING OPERATING UNIT

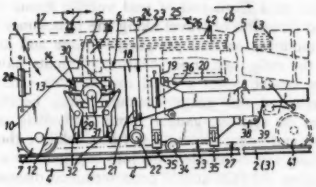
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed May 26, 1983, Ser. No. 498,260

Claims priority, application Austria, Sep. 9, 1982, 3387/82

Int. Cl.³ E01B *27/17*

U.S. Cl. 104—7 B **16 Claims**



1. An operating unit for tamping, leveling and lining a track consisting of two rails fastened to successive ties resting on ballast, for installation in a mobile track working machine comprising a machine frame supported on two undercarriages spaced in the direction of the track for mobility on the track in an operating direction, the operating unit being comprised of a ballast tamping assembly comprising a tamping tool carrier, a drive for vertically adjusting the tamping tool carrier, pairs of vibratory and reciprocatory tamping tools mounted on the tamping tool carrier for immersion in successive cribs, with a respective one of the ties positioned between the tools of the pairs, and drives for vibrating and reciprocating the tamping tools; a track leveling and lining assembly adjacent the tamping assembly and comprising track-engaging track lifting and lining tools, drives for moving the tools respectively in a vertical and transverse direction for leveling and lining the track; and a separate carrier frame common to, and supporting, the assemblies, a set of flanged wheels constituting a sole support and guide element for a rear end of the carrier frame on the track, the carrier frame rear end being remote from one of the undercarriages immediately preceding the set of flanged wheels in the operating direction, and the carrier frame having an elongated front end, in the operating direction, and a universal joint linking the front end of the carrier frame to, and supporting it on, the track working machine frame; and a leveling and lining reference system associated with the operating unit.

4,534,296

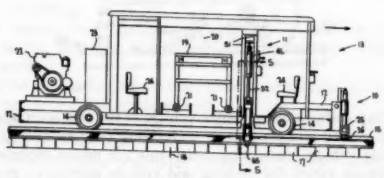
RAIL GAUGER

John L. Stubbs, Charlotte, and Carl B. Loflin, Denver, both of N.C., assignors to Southern Railway Company, Washington, D.C.

Filed Apr. 29, 1983, Ser. No. 490,025

Int. Cl.³ E01B *33/00, 33/02*

U.S. Cl. 104—8 **4 Claims**



1. A track gauger on the frame of a vehicle adapted for movement along the rails of a track, the gauger comprising a vertically movable gauger frame disposed crosswise of said

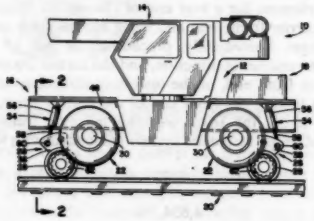
vehicle frame, a pair of gauger bars fixedly mounted on said gauger frame and having outer edges spaced apart in crosswise direction of a fixed distance for establishing a predetermined rail gauge distance, means for lowering said frame for extending said gauge bars between the rails, a pair of gauge levers mounted for movement on said gauger frame about pivot axes spaced respectively outwardly of said bars, means for pivoting said levers into engagement with the rails for gauging the rails at said predetermined distance upon engagement between the rails and said outer edges of said gauge bar, a track pre-gauger having a frame lying in said crosswise direction and being mounted on a front end of said vehicle frame relative to a forward direction of travel along the rails, inner bearing elements mounted on said pre-gauger frame and extending between the rails, said inner bearing elements having bearing surfaces spaced apart a fixed distance for establishing said predetermined rail gauge distance, outer bearing elements mounted on said pre-gauger frame outwardly of said inner elements and being inwardly shiftable relative thereto, means for shifting said outer elements into engagement with the rails for gauging the rails at said predetermined distance upon engagement between the rails and said bearing surfaces of said inner elements, a spike driving device mounted on said vehicle frame rearwardly of said track gauger frame, limit switch means on said gauger frame for actuating said shifting means, said limit switch means being operated by one of said rail gauge levers upon the pivoting of said levers into engagement with the rails, whereby engagement of the rails by said gauge bars and levers, and by said bearing elements, provide spaced rail holding points during a spike driving operation.

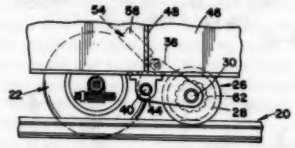
4,534,297

WHEEL POSITION CONTROL FOR RAILWAY MAINTENANCE VEHICLE

Theodore C. Johnson, Sr., 14917 Hillbrook Cir., Novelty, Ohio 44072

Filed Dec. 2, 1982, Ser. No. 446,369
Int. Cl.³ B61D *15/00*; **B61F** *13/00*
U.S. Cl. 105—215 C **14 Claims**





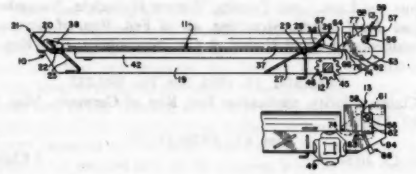
1. In a railway maintenance vehicle of the character adapted to be moved along a pair of underlying railway rails and including vehicle frame means, drivable tire means mounted on said frame means for moving said vehicle relative to ground, flanged rail engaging wheel means laterally between said tire means and supported on said frame means for displacement between first and second positions relative to said frame means, said wheel means in said first position engaging said pair of rails and supporting said vehicle for said tire means to be spaced above ground and supported in suspension from said frame means, whereby the entire weight of said vehicle is supported on said rails by said wheel means, said wheel means in said second position being elevated from said pair of rails for said tire means to engage ground laterally outwardly of each rail of said pair, whereby the entire weight of said vehicle is supported by said tire means, and means to displace said wheel means between said first and second positions, the improvement comprising: means to displace said wheel means to a third position in which said vehicle is supported for maintenance operation, said third position being between said first and second positions and providing for said tire means to engage ground laterally outwardly of each rail of said pair of rails to provide primary lateral support for said maintenance vehicle laterally outwardly of each of said rails and in which third position said wheel means engage said pair of rails to provide a stabilizing force for said maintenance vehicle laterally inwardly of said tire means.

4,534,298

LOCK AND SEAL FOR HOPPER OUTLET

Mark P. Scott, Boiling Springs, Pa., assignor to Keystone Industries, Inc., Rolling Meadows, Ill.

Filed Feb. 16, 1983, Ser. No. 467,155
Int. Cl.³ B61D *7/20*, *7/22*
U.S. Cl. 105—282 R **4 Claims**



1. A discharge outlet and lock for a hopper car, comprising a side frame adapted to be secured to the car, a door plate slidably supported on said side frame for movement between an open position and a closed position, a lock comprising a rod rotatably supported on said side frame adjacent to and above the path of movement of said plate, at least one latch secured to said rod and rotatable with said rod between an engaged position, a disengaged position and a tripped position, said latch including a first portion which when in said engaged position engages the door plate and holds the door plate in the closed position, said latch further including a second portion which when in said disengaged position extends in the path of movement of the door plate, said second portion being located to be struck by said door plate upon movement of said door plate toward the open position and to be thereby moved to said tripped position, said latch when in said tripped position resting on said door plate and being in position for subsequent automatic movement to said engaged position upon return of said door plate to its closed position, said latch being mounted on said rod closely adjacent said side frame, a first seal hole formed in said latch, a second seal hole formed in said side frame, and said first and second seal holes being generally aligned when said latch is in said engaged position, said side frame having outer edges and said second seal hole being spaced from the nearest portion of said outer edge, said seal holes being adapted to receive a seal band, said seal holes being located relative to said nearest portion of said outer edge such that said first seal hole of said latch moves away from said nearest portion of said outer edge and tensions the seal band when said latch is initially moved from said engaged position toward said disengaged position, and said spacing being related to the length of the seal band to result in removal of slack from the band when the seal is connected around said nearest portion of said outer edge.

4,534,299
WET ASH REMOVAL EQUIPMENT

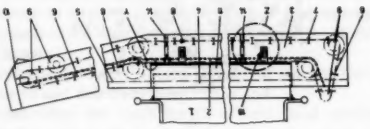
Horst Buchmüller, Hünxe, and Bernhard Michelbrink, Wesel-Bislich, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Werke Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

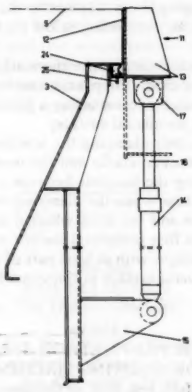
Filed Feb. 1, 1985, Ser. No. 697,337

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1984, 3408279

Int. Cl.³ F23J *1/00*

U.S. Cl. 110—165 R **3 Claims**





1. Wet ash removal equipment a steam boiler with an ash funnel; a movable trough filled with quenching water and located beneath said ash funnel of said steam boiler; ash conveyor means operating within the trough; an immersion member attached to said ash funnel so that it can project down below the surface level of the water in said trough; one side wall of said trough having a removable plate forming a sealed joint, said plate having a length which is greater than the length of said immersion member, said plate having a height measured from an upper rim of said trough which is greater than maximum depth of immersion of said immersion member; a height-adjustable rod linkage supporting said plate, movement of said plate being guided by a side of said trough.

4,534,300
COMBUSTION CHAMBER FOR COMBUSTION DISPOSAL OF WASTE MINERAL BEARING STREAMS

Robert D. Reed, and John M. Cegielski, Jr., both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Nov. 10, 1980, Ser. No. 205,713

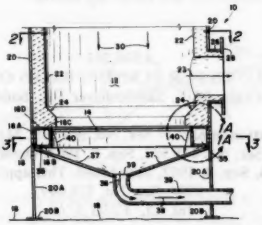
Int. Cl.³ F23J *1/06*

U.S. Cl. 110—171 **4 Claims**

1. In a combustion chamber for the combustion disposal of waste mineral-bearing liquid streams, in which a vertically-disposed cylindrical refractory-lined combustion chamber is provided with down-flow of fuel, air, flame, micronized waste liquid and products of combustion, the improvements in means for removing the products of combustion and for collecting and removing solid waste and solidified mineral compounds, comprising:

(a) an exit opening adjacent the bottom of the combustion chamber for said removal of said products of combustion;

(b) an inverted conical, or funnel-shaped floor plate positioned below the combustion chamber, with drain means for disposal of said solid waste and compounds;



(c) a circular, annular or peripheral channel between the top of the floor plate and the bottom of the combustion chamber, means to flow water tangentially into said channel, and a circumferential gap between the bottom of said combustion chamber and an inner wall of said channel, so that said water flows in a circular motion through said gap and onto the sloping floor plate, carrying solidified and particulate waste down said drain means.

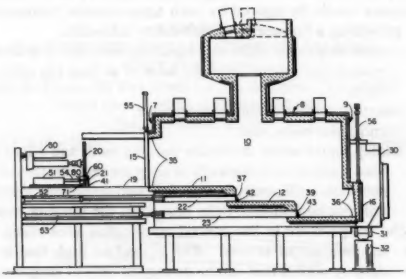
4,534,301
INCINERATOR ASH REMOVAL SYSTEMS

George Sakash; Robert K. Grier, Jr.; Hansjoerg Stern; Abdul G. Dada, all of Wilmington, and Daniel W. McKeel, Rocky Point, all of N.C., assignors to General Electric Company, San Jose, Calif.

Filed Jun. 8, 1984, Ser. No. 618,690

Int. Cl.³ F23G *3/00*

U.S. Cl. 110—255 **11 Claims**



1. An incinerator wherein combustible material is reduced to ash, comprising:

an incinerating chamber of substantially uniform width having first and second substantially opposite chamber ends;

means for loading said combustible material into said chamber at said first chamber end;

means for receiving said ash from said chamber at said second chamber end;

at least one plow positioned inside said chamber adapted to travel at least a portion of the distance between said opposite chamber ends in sliding contact with the chamber floor, said plow including a plow face substantially spanning said chamber width; and

a brush comprising metallic bristles hingedly suspended on

said plow face so as to normally make contact with said floor, said brush being substantially coextensive with said plow face in the direction of said chamber width, said brush being adapted to sweep floor debris ahead of said plow face during forward plow travel toward said second chamber end and to prevent said debris from being carried back during reverse plow travel;

whereby said ash in said chamber is moved substantially only toward said ash receiving means.

4,534,302

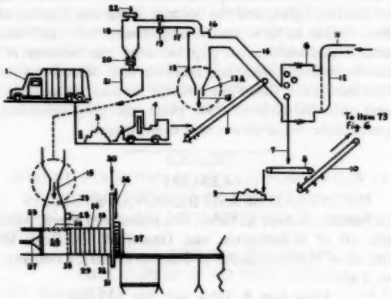
APPARATUS FOR BURNING BALES OF TRASH

Charles A. Pazar, 98 E. Saddle River Rd., Saddle River, N.J. 07458

Continuation-in-part of Ser. No. 264,515, May 18, 1981, abandoned, Ser. No. 415,957, Sep. 8, 1982, abandoned, and Ser. No. 415,786, Sep. 8, 1982, abandoned. This application Feb. 9, 1984, Ser. No. 578,649

Int. Cl.³ F23G *5/10*

U.S. Cl. 110—346 **28 Claims**



9. The method of destroying wastes that can be destroyed only at temperatures so high that refractory sidewalls of a furnace would be injured by such temperatures, comprising:

providing a furnace with refractory sidewalls,

compacting trash under a compacting pressure of at least ten pounds per square inch into bales of at least ten cubic feet each,

inserting said bales into said furnace,

burning the bales, and

adding liquid water above the burning bales and adjacent at least some of said sidewalls to keep the temperature of said sidewalls sufficiently low so that said refractory sidewalls will not be injured by the heat from the burning bales,

the temperature in the central combustion area rising to a temperature of at least 1400° F. and so high that it will destroy wastes that can be destroyed only at temperatures so high that refractory sidewalls of the furnace would be injured by such temperatures, and

adding to said central combustion area wastes that can be destroyed only at temperatures which are so high as to injure said refractory sidewalls.

13. A method of burning trash in a furnace comprising:

feeding air into the trash to blow the light trash away from the heavy trash; and thereby sort the trash into light trash and heavy trash,

compacting, with a pressure of at least ten pounds per square inch, the light trash, resulting from said sorting step, into bales, with each bale having a size of at least ten cubic feet,

feeding said bales, one after another, into the furnace and burning the bales in the furnace, and

feeding the heavy trash, resulting from said sorting step, onto the top of at least one of said burning bales.

4,534,303

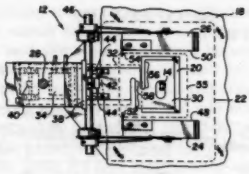
APPARATUS FOR SEWING 360 DEGREE PATTERN

Joseph W. A. Off, Irving, and Vivian Ferguson, Dallas, both of Tex., assignors to Train-A-Mation, Inc., Irving, Tex.

Filed Sep. 30, 1983, Ser. No. 537,482

Int. Cl.³ D05B *3/00, 27/00*

U.S. Cl. 112—114 **10 Claims**



1. A sewing machine attachment for sewing a label to a workpiece, comprising in combination:

a sliding cloth plate for supporting the workpiece;

means for clamping the workpiece to the cloth plate;

a backup clamp for positioning below the workpiece and the label;

a template for positioning above the workpiece and the label opposite the backup clamp, said template having a predetermined contour and including a first peripheral surface and a second peripheral surface;

means for releasably clamping the workpiece and the label between the backup clamp and the template; and

means for moving the template between a first position and a second position when the clamping means has released the workpiece and the label wherein at least part of the contour of the first peripheral surface in the first position substantially aligns with at least part of the contour of the second peripheral surface in the second position.

4,534,304

STITCH CORRECTION METHOD AND APPARATUS FOR A SEWING MACHINE

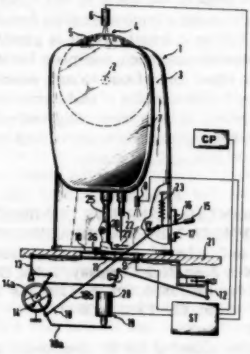
Kurt Reinke, Bielefeld, Fed. Rep. of Germany, assignor to Durkoppwerke GmbH, Bielefeld, Fed. Rep. of Germany

Filed Oct. 6, 1983, Ser. No. 539,676

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3236932

Int. Cl.³ D05B *19/00, 27/22*

U.S. Cl. 112—262.1 **11 Claims**



1. A method of terminating a stitch row in a workpiece at a predetermined location short of a reference point thereon, which comprises the steps of:

(a) in a stepwise manner displacing said workpiece past a

stitching location at which a sewing machine needle penetrates said workpiece in transport steps synchronized with the displacement of said needle and each resulting in the formation of a stitch of an original length of said row;

(b) subdividing each of said transport steps into a multiplicity of segments and generating for each of said segments a train of countable pulses;

(c) detecting the passage of said reference point past a location at a predetermined distance from said needle and initiating a count of said pulses upon such detection;

(d) counting the pulses from the start of each stitch to a point in the transport step during which count initiation is commenced in step (c) to provide a count representing the segment of the latter transport step at which the count was initiated;

(e) continuing to sew a fixed number of stitches from the time of said detection in said row; and

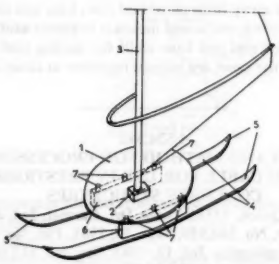
(f) controlling the stitch length of said fixed number of stitches so that said fixed number of stitches constitutes a stitch combination of stitches which may be of the original length reduced by a fixed amount so that based upon the counts, the stitch combination is selected which has a total length ensuring a last penetration of said needle into said workpiece for said row at said predetermined location on said workpiece, a series of such stitch combinations being stored in an electronic memory and the selected stitch combination being recalled from said memory based upon said counts.

4,534,305

SAIL SKI DEVICE

Francois Lecomte, "La Grande Chalande", 88530 Le Tholy, France

Filed Feb. 22, 1983, Ser. No. 468,634
Claims priority, application France, Aug. 11, 1982, 82 14142
Int. Cl.³ A63C *15/00*
U.S. Cl. 441—73 **2 Claims**



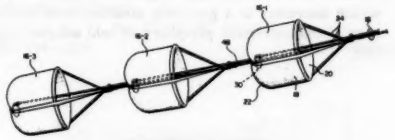
1. Sail ski device, essentially constituted by a platform (1) for mounting a mast (3) and for supporting the user and having an anti-skid coating, and secured to a pair of skis (4), characterized in that the skis (4) have a longitudinal section incurved from the center toward the ends, which are each provided with a nose (5), and in that the central portion of each ski (4) is provided with a vertical rigid mounting member (6) on which are mounted elastic blocks (7) secured to the platform (1), in which for use on ice, the skis (4) are provided with metallic runners (8) extending beneath their central portion, and secured by means of clamps (9) or the like, their lateral bearing being ensured by means of stirrups (10) secured to the runners (8) and bearing on the sides of the skis (4).

4,534,306

SEA ANCHOR

Peter T. Rutten, Plainfield, Ill., and James E. Kalinowski, Minneapolis, Minn., assignors to Blue Harbor, Inc., Minneapolis, Minn.

Filed Jun. 13, 1983, Ser. No. 503,905
Int. Cl.³ B63B *21/48*
U.S. Cl. 114—311 **2 Claims**



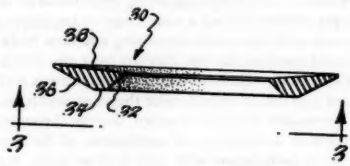
1. A tandem array of sea anchors each made of cloth or the like and comprising a generally umbrella shaped body open at one end and having a relatively small opening at the apex thereof, a plurality of elongated tow members secured to the periphery of the open end in arcuately spaced fashion, a common tow cable adapted to be secured to a boat and secured to the elongated tow members of all of said plurality of sea anchors and extending freely through the apex opening of each sea anchor save the last, common control cable means adapted to be manipulated from a boat and secured to each of said sea anchors adjacent the respective apex opening, said tow cable means extending through the apex opening of each sea anchor save the last for partially inverting said sea anchors to vary the drag of said tandem array of sea anchors, said control cable means comprising a single cable for simultaneously partially inverting all of said sea anchors, the elongated tow members of each sea anchor being joined together at a junction forwardly of the respective sea anchor for securement to said tow cable, and guide means at each junction for said control cable means, and means on said control cable means engagable with said guide means to limit inverting of said sea anchors short of complete inversion.

4,534,307

ADAPTER FOR INSTALLATION OF MARINE INSTRUMENTS

Ronald R. Overs, 96 Fox Hunt La., E. Amherst, N.Y. 14051

Filed Oct. 7, 1983, Ser. No. 540,042
Int. Cl.³ G01C *21/00*
U.S. Cl. 114—343 **2 Claims**



1. An adapter for converting flush mount installation of marine instruments and the like to surface mount installation, said adapter comprising:

an adapter member (30) consisting of a sealing washer fabricated of a resilient material and of generally dish-shaped construction including a central frustoconical opening (32);

a first annular, generally smooth end surface (38) inclined inwardly from an outer edge to an inner edge contiguous with said opening (32) for forming a generally smooth concave profile;

a second annular, generally smooth end surface (34) dis-

posed opposite from said first end surface (38) and being substantially flat from an outer edge to an inner edge;

an annular generally smooth inclined connecting surface (36) having an inner edge joined with the outer edge of said second annular end surface (34), and an outer edge joined with the outer edge of said first annular end surface (38);

said first annular end surface (38) and said annular connecting surface (36) converging outwardly of said adapter member (30) for forming a gradually tapered portion which decreases at a generally constant rate and has its apex at the outermost periphery of said adapter member (30).

4,534,308

APPARATUS FOR APPLYING TREATING MEDIA ONTO WEBS

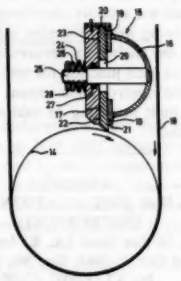
Alfred Kretschmer, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 1, 1982, Ser. No. 438,276

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146618

Int. Cl.³ B05C 1/12

U.S. Cl. 118—260 **6 Claims**



1. Apparatus for the self-regulating application of an aqueous treating medium having a wide range of viscosities, onto a running web, said apparatus comprising a hollow body which contains said medium therein, extends over the width of the web and has, on the side from which the application is effected, a restrictor gap which extends over the same width, and has a strip of permeable material inserted therein throughout the length, taken in the direction of application, of the gap,

wherein, in association with said hollow body, there are provided spring means for spring-loaded said hollow body at all times in the direction of the medium-containing interior of said body, and means for mounting said hollow body, including the components thereof which define said gap and have said strip of permeable material inserted therein, to be movable, for a corresponding adjustment of the gap, at right angles to the length of the gap, and, under the force of the spring means compress said strip of material, so that said gap and hence the amount of the throughput are automatically adjusted by the medium pressure acting against the spring means, thereby to automatically compensate for changes in medium pressure in accordance with temperature and hence viscosity variations.

4,534,309

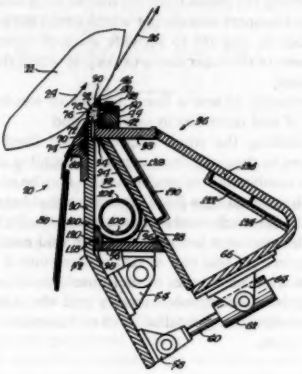
PAPER COATING APPARATUS

Wayne A. Damrau; William C. Vreeland, both of Wisconsin Rapids, Wis.; Richard Bernert, Giengen, and Albert Wöhrle, Heidenheim, both of Fed. Rep. of Germany, assignors to Consolidated Papers, Inc., Wisconsin Rapids, Wis. and J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,758

Int. Cl.³ B05C 5/02

U.S. Cl. 118—410 **12 Claims**



1. An improved applicator for applying coating liquid to a moving web of paper, wherein said applicator is of a type comprising an elongate body having front and rear relatively movable walls, a base wall between said front and rear walls and end walls at opposite ends thereof mounted on said rear wall, said front, rear, base and end walls defining a chamber therebetween and ends of said front and rear walls, generally opposite from said base wall, being spaced apart and defining an elongate opening from said chamber positionable adjacent to and transversely across the web; and means for introducing coating liquid under pressure into said chamber for being directed through said opening and onto the web, the improvement being characterized in that said front wall is movable relative to and away from all of said rear, base and end walls to open said chamber, and a seal means is between said front wall and each of said end and base walls for sealing said front wall thereto when the same are moved together to close said chamber.

4,534,310

APPARATUS AND METHOD FOR PROCESSING WIRE STRAND CABLE FOR USE IN PRESTRESSED CONCRETE STRUCTURES

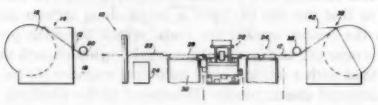
Nathaniel R. Quick, 13181 Tudor Dr., Carmel, Ind. 46032

Division of Ser. No. 242,939, Mar. 12, 1981, Pat. No. 4,439,282.

This application Jul. 11, 1983, Ser. No. 512,680

Int. Cl.³ B05B 5/02

U.S. Cl. 118—620 **3 Claims**



1. An improved apparatus for producing a steel wire strand cable having a substantially pure rust coating on all surfaces thereof comprising, in combination:

(a) a pay-off reel means and a take-up reel means for a wire

strand cable which is passed continuously from said pay-off reel along a prescribed path through a series of in-line devices to said take-up reel at a predetermined speed;

(b) an induction heating means located in-line with and between said pay-off and take-up means for applying heat thereto as said cable passes therethrough, whereby said cable is elevated to a predetermined temperature in passing;

(c) pre-quenching means in-line with said heating means for receiving said heated cable and for rapidly quenching said cable to a preselected lower temperature with a liquid as said cable passes through said pre-quenching means along said prescribed path;

(d) an ultrasonic cleaning means in-line with said pre-quenching means for continuous ultrasonic surface and deep crevice cleaning of said cable by means of high frequency cavitation action induced in a liquid coupling medium generated by a magneto-restriction component of said ultrasonic cleaning means through which the cable passes, said liquid being maintained at a preselected temperature and pressure; and

(e) a post-quenching means in-line with said ultrasonic cleaning means for further lowering the temperature of said cable as it exits from said post-quenching means to air along said prescribed path to said take-up reel, whereby said cable commences immediately upon leaving said post-quenching means to have said rust formed on the entire surfaces of said cable as it travels in air toward said take-up reel which rotates at a continuous preselected rate during operation of said improved apparatus.

4,534,311
APPARATUS FOR ELECTROSTATIC SPRAY-ENAMELING

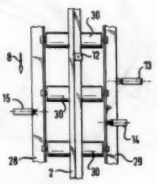
Karl-Heinz Reinlein, Dettelbach, and Bruno Stäblein, Würzburg, both of Fed. Rep. of Germany, assignors to Fulguvit GmbH & Co. K.G., Wunstort, Fed. Rep. of Germany

Filed Dec. 15, 1983, Ser. No. 561,927

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246574

Int. Cl.³ B05D *1/04*

U.S. Cl. 118—630 **17 Claims**



3. An apparatus for electrostatically spray enameling plastic parts comprising:

a spray booth,

means for electrostatically spraying enameling mounted in said booth,

at least a first roller conveyor located in front of said spray booth and adapted to feed said plastic parts to said spray booth,

at least a second roller conveyor located behind said spray booth and adapted to remove said plastic parts from said spray booth,

said first and second roller conveyors having a plurality of driven rollers,

said first and second roller conveyors having a plurality of electrically conductive rollers connected to ground,

said first roller conveyor having at least one roller having means for applying a conducting liquid thereto; and

said second roller conveyor having at least one roller having means for applying a conducting liquid thereto.

4,534,312
VACUUM EVAPORATION APPARATUS

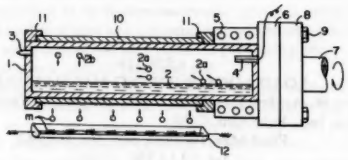
Ryohei Shinya; Shin'ichi Miura, both of Tokyo, and Rikio Aozuka, Kanagawa, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Aug. 30, 1983, Ser. No. 527,662

Claims priority, application Japan, Aug. 30, 1982, 57-129802[U]; Dec. 9, 1982, 57-216040; Dec. 10, 1982, 57-216659; Feb. 16, 1983, 58-24326; Feb. 16, 1983, 58-24327; Feb. 16, 1983, 58-20107[U]; Feb. 17, 1983, 58-23739; Apr. 25, 1983, 58-72576; May 20, 1983, 58-88957

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—666 **24 Claims**



1. A vacuum evaporation apparatus for depositing an evaporant on a substrate in a vacuum chamber, comprising:

(a) a substrate support for mounting thereon the substrate, said substrate support comprising a sealed container filled therein with a heat medium with any incondensable gas removed therefrom;

(b) heating means for supplying heat to said heat medium in said substrate support to vaporize said heat medium;

(c) wetting means including means on inner walls of said substrate support for wetting the walls and condensing the vaporized heat medium continuously thereon to effect thermal transfer of heat to said inner walls and uniformly heat said substrate support as said evaporant is deposited on said substrate; and

(d) cooling means for cooling the substrate through said substrate support after the evaporant has been deposited on the substrate.

4,534,313
MARKING APPARATUS

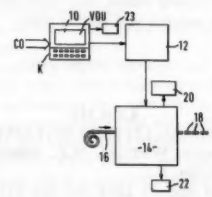
Robin Louvel, Cornwall, England, assignor to Bowthorpe-Hellermann Limited, West Sussex, England

Filed Sep. 2, 1983, Ser. No. 529,128

Claims priority, application United Kingdom, Sep. 2, 1982, 8225055

Int. Cl.³ B05C *1/02*

U.S. Cl. 118—696 **13 Claims**



1. An apparatus for producing marker sleeves from a tubular member, said marker sleeves having a selected length and a selected indicia thereon, said apparatus comprising

a backing member over which said tubular member passes as it moves in its longitudinal direction so as to temporarily become at least partially flattened as it moves thereover,

a cutting means for at least partially cutting said tubular member into segments of a selected length, said segments providing said marker sleeves,

a first transport means for supporting said tubular member between said backing member and said cutting means and being capable of moving said tubular member in its longitudinal direction from said backing means towards said cutting means,

a marking means for applying a selected indicia on said tubular member as it moves over said backing member, said marking means being capable of applying a continuous mark on said tubular member in at least a direction transverse to its longitudinal direction, and

a means for receiving orders specifying the selected indicia to be applied on the tubular member and for supplying corresponding control signals to said marking means.

4,534,314

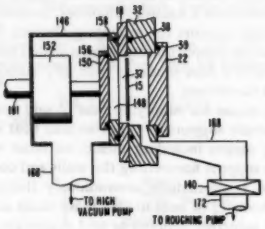
LOAD LOCK PUMPING MECHANISM

James W. Ackley, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed May 10, 1984, Ser. No. 609,052

Int. Cl.³ C23C *13/08*

U.S. Cl. 118—733 **14 Claims**



1. A pumping mechanism for a vacuum chamber comprising:

a load lock having a front closure means through which a workpiece is inserted into said chamber and a rear closure means;

said rear closure means having wall means forming a movable mini-chamber which forms a connection with an external pumping means, said mini-chamber including sealing means with said load lock and a ram whereby to close said rear closure means; and

valve means including a sealing plate with sealing means inside said mini-chamber whereby to seal said load lock from said pumping means, said valve means including an actuator for moving said sealing plate.

4,534,315

ANIMAL LITTER CONTAINER

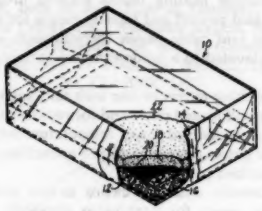
William J. Sweeney, Westfield, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Filed Aug. 29, 1983, Ser. No. 527,123

Int. Cl.³ A01K *29/00, 1/035*

U.S. Cl. 119—1 **8 Claims**

1. An animal litter container comprising (a) a receptacle containing a lower layer of moisture-absorbent solid material covered by a liquid-permeable upper layer of moisture-impervious particulate material, the upper layer being coextensive with and contiguous to the lower layer, and (b) a foraminous liquid-permeable barrier means disposed coextensively with the upper layer and lower layer and positioned between the lower layer and the top of the upper layer, said barrier means comprising an odor abatement means comprised of a liquid and vapor-impermeable material which is perforated and thereby



rendered liquid-permeable, and is effective to reduce the emanation of odors from the lower layer.

4,534,316

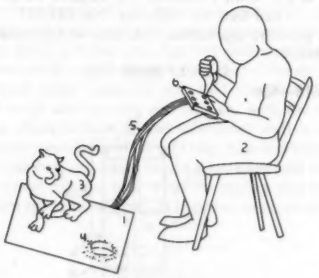
CAT TOY

David B. Bowlsby, 533 W. State St., Ithaca, N.Y. 14850

Filed May 17, 1984, Ser. No. 611,203

Int. Cl.³ A01K *29/00*

U.S. Cl. 119—29 **10 Claims**



1. A toy for cats, comprising:

a. blanket means of dimensions whereby an animal may walk on the same, comprising:

1. flexible base means made of durable material;

2. flexible cover means adhered to substantially all of one surface of the base means;

b. a plurality of riser means, spaced apart and located between the base and cover means, for selectively separating the base and cover means at a plurality of points over the area of the blanket means, whereby the blanket means may be made to bulge at said points by the introduction of air into the riser means;

c. a plurality of conduit means in air-flow communication with each of the plurality of riser means, whereby introduction of air into one of the conduit means will inflate the riser means in communication therewith;

d. remote control means for selectively inflating one or more risers, comprising air induction means in air-flow communication with one or more of the conduit means.

4,534,317
PROCEDURES FOR MONITORING FISH FOOD CONSUMPTION

Myles A. Walsh, Falmouth, Mass., assignor to Cape Cod Research, Buzzards Bay, Mass.

Filed Aug. 30, 1984, Ser. No. 645,788
Int. Cl.³ A01K *61/00*
U.S. Cl. 119—51 R **14 Claims**

1. A method for determining the proper amount of food for consumption by a culture of fish and/or crustaceans comprising the steps of:

a. spiking food with non-toxic fluorescent dyes;

b. administering a pre-determined amount of said spiked food to said culture;

c. allowing sufficient time for said spiked food to be eaten;

d. exposing water from said culture to light near or at the maximum absorption wavelength of said dye(s);

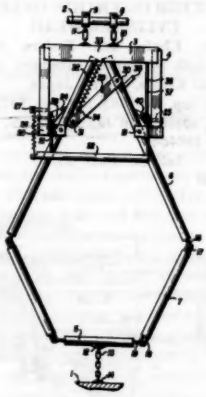
e. measuring the intensity of the fluorescence of said culture water at or near the maximum emission wavelength(s) of said fluorescent dye(s); and,

f. adjusting the amount of food administered to said culture, according to said measurement(s).

4,534,318
DEVICE FOR TYING-UP AN ANIMAL

Noël VandeVelde, Rte. de Mettet 201, B - 6838 Pavillons/-Florennes, Belgium

Filed Jun. 23, 1983, Ser. No. 507,138
Claims priority, application Belgium, Jun. 25, 1982, 2/59752
Int. Cl.³ A01K *1/06*
U.S. Cl. 119—147 R **7 Claims**



1. A device for tying up an animal comprising:

a suspension element comprised of

a base to be hung from a fixed structure and

two arms having upper ends fixed to said base and lower ends,

said base and said arms defining a plane,

a bottom piece to be connected to the fixed structure,

first pins supported by said arms adjacent to said lower ends, at right angle to said plane,

two legs forming together with the bottom piece one yoke, each of said legs being comprised of

a top part,

a lower part,

a first hinge connecting the top part to the lower part, and

a second hinge connecting the lower part to the bottom piece,

each of said top parts hinging about one of said first pins and having a portion projecting above the first pin and a portion projecting under the first pin, said first hinges and said second hinges allowing a movement of said lower parts as well in said plane as outside said plane,

second pins supported by said arms parallel to said plane,

a control member comprised of

a base, and

two arms,

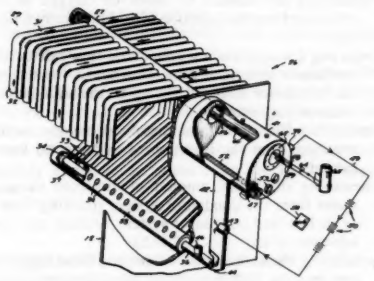
said arms of said control member having ends fixed to said base of said control member and ends hinging about said second pins, the control member thus hinging about said second pins with respect to said suspension element between a first position in which the base of the control member is lower than said second pins and a second position in which the base of the control member is higher than said second pins, said control member acting on said portions of said top parts projecting above said first pins and retaining in its first position said portions projecting above said first pins in a converging position and retaining in its second position said portions projecting above said first pins in a parallel position, and

a spring having two ends, one of said ends being connected to the control member and the other of said ends being connected to the suspension element, said spring passing through a dead position when the control member moves from its first position to its second position and pulling on one side of the dead position the control member to the first position and pulling on the other side of the dead position the control member to the second position.

4,534,319
WOOD BURNING STOVE HEAT EXCHANGER

Joseph T. Manno, Box 24, Star Rte., Kane, Pa. 16735

Filed Mar. 13, 1984, Ser. No. 589,214
Int. Cl.³ F22B *5/00*
U.S. Cl. 122—15 **20 Claims**



1. A wood or coal burning stove comprising:

a plurality of walls defining a fire chamber, with a flue disposed in one of said walls;

a door in one of said walls providing access to said fire chamber; and

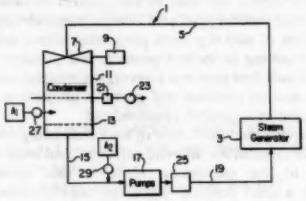
means for circulating liquid through said fire chamber to heat the liquid when a fire is burning in said fire chamber, said means including: a first manifold; a second manifold; means for supporting said first and second manifolds so that they are generally horizontally extending, and vertically spaced from each other, said first manifold above said second manifold; a plurality of fuel supporting pipes physically and fluidly interconnecting said first and second manifolds; a liquid inlet means to said second manifold; a liquid outlet means from said first manifold; and pressure relief means for relieving pressure in said liquid circulating means if it becomes too great;

said inlet means comprising an inlet pipe, said inlet pipe extending generally horizontally and generally concentrically within said second manifold, said inlet pipe entering one end of said manifold and extending all the way to a point adjacent the opposite end of said second manifold at which point it discharges liquid into said manifold.

4,534,320
METHOD FOR DETERMINING THE AMOUNT OF DISSOLVED OXYGEN FROM ABOVE AND BELOW WATER LEVEL AIR LEAKAGE IN A STEAM POWER PLANT

Alexander D. MacArthur, Export, and Harry J. Everett, West Mifflin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 1, 1984, Ser. No. 585,063
Int. Cl.³ F22D *7/00*
U.S. Cl. 122—406 R **7 Claims**



1. A method for determining the amount of dissolved oxygen in the aqueous medium of a steam plant containing a condensor system including a condensor and recirculating pumps, the condensor having a hotwell, resulting from air leakage into the condensor above the water level in said hotwell and from air leakage below the water level in said hotwell and up to the suction side of the recirculating pumps, comprising:

injecting a first known volumetric flow rate of air into the condensor system above the water level in the condensor hotwell;

measuring the amount of dissolved oxygen in the water resulting from the injection of said first known flow rate of air;

injecting a second known volumetric flow rate of air into the condensor system, at a location below the water level in the condensor hotwell and up to the suction side of the recirculating pumps;

measuring the amount of dissolved oxygen in the water resulting from the injection of said second known flow rate of air;

measuring the actual amount of dissolved oxygen in the water from the condensor system resulting from leakage of air into said condensor system, without any intentional injection of air;

measuring the actual total volumetric flow rate of air leakage into the system without any intentional injection of air; and

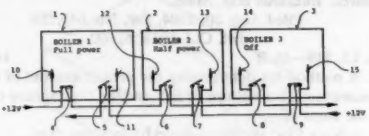
determining from said four measurements and said two injection rates the amount of said dissolved oxygen in the water resulting from leakage into the system above the water level in the condensor and that amount resulting from leakage into the system below the water level in the condensor.

4,534,321
APPARATUS FOR CONTROLLING A NUMBER OF BOILERS

Sten A. Rydborn, Klöxhultsvägen 21, S-343 00 Älmhult, Sweden

Filed Nov. 5, 1982, Ser. No. 439,489
Claims priority, application Sweden, Feb. 22, 1982, 82010745
Int. Cl.³ F22D *37/42*
U.S. Cl. 122—448 B **11 Claims**

1. An apparatus for controlling a number of boilers which each are provided with their control equipment and are, in terms of water engineering, interconnected in series in such a manner that return water from the circulation system enters the first boiler in the series and continues through the other boilers and is thereafter redischarged into the circulation system, characterized in that the control equipment is provided with a first switch means associated with a boiler for providing a signal which enables the control equipment of a following boiler in the series-connection to increase the output of the

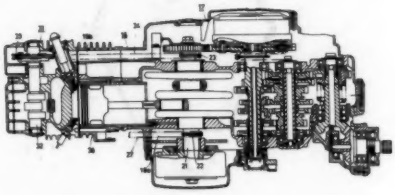


following boilers, and second switch means associated with a boiler for providing a signal which enables the control equipment of a preceding boiler in the series-coupling to reduce its output.

4,534,322
ARRANGEMENT FOR INSERTION OF SPARK PLUGS IN CYLINDER HEAD

Minoru Matsuda, Chofu, and Toshiro Mitsuishi, Higashimurayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1983, Ser. No. 537,225
Claims priority, application Japan, Sep. 29, 1982, 57-170702; Nov. 12, 1982, 57-198464
Int. Cl.³ F02P *15/05*
U.S. Cl. 123—55 R **4 Claims**



1. Arrangement for inserting a spark plug in an engine cylinder head comprising a combustion chamber having a wall, a cam chain chamber having a wall and an endless cam chain within said chamber, said arrangement comprising

(a) a first opening in said wall of said cam chain chamber for inserting said spark plug with its outer end extending through said cam chain chamber;

(b) screw threaded second opening having a smaller diameter than said first opening, in said wall of said combustion chamber;

(c) a separate sleeve surrounding said spark plug inserted through said first opening, said sleeve being screw threaded at its inner end encircled by said cam chain;

(d) means for screwing and unscrewing said sleeve into engagement with said second opening; and

(e) means for sealing the ends of said sleeve against leakage of oil.

4,534,323
VALVE OPERATION CHANGING SYSTEM OF INTERNAL COMBUSTION ENGINE

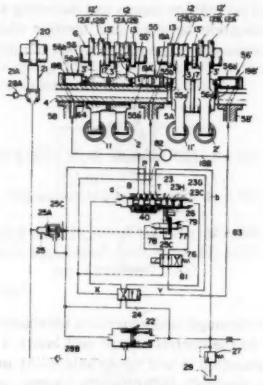
Manabu Kato, Tokyo, and Shunichi Aoyama, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Nov. 17, 1983, Ser. No. 552,832

Claims priority, application Japan, Dec. 23, 1982, 57-231202; Mar. 28, 1983, 58-50390

Int. Cl.³ F01L *1/34*

U.S. Cl. 123—90.16 **34 Claims**



1. A valve operation changing system of an internal combustion engine, comprising:

first and second cams formed on a camshaft and different in cam profile from each other;

a rocker arm mounted on a rocker shaft and swingable around the rocker shaft to operate an engine valve upon engagement with said cams, said rocker arm being axially movable to engage with said first cam when said rocker arm is in a first position and to engage with said second cam when said rocker arm is in a second position; and

means for selectively moving said rocker arm into one of said first and second positions in accordance with an engine operating condition, said moving means including:

means defining first and second hydraulic pressure chambers which are fluidly connectable with an oil pressure source to be supplied with pressurized oil, said first hydraulic pressure chamber causing said rocker arm to move into the first position when fluidly connected with the oil pressure source, said second hydraulic pressure chamber causing said rocker arm to move into the second position when fluidly connected with the oil pressure source;

a flow direction changing valve through which said first and second hydraulic pressure chambers are communicable with the oil pressure source, said flow direction changing valve selectively taking one of a first state to fluidly connect said first hydraulic pressure chamber with the oil pressure source and a second state to fluidly connect said second hydraulic pressure chamber with the oil pressure source; and

valve means fluidly interposed between said flow direction changing valve and said second hydraulic pressure chamber, said valve means being openable to fluidly connect said flow direction changing valve with said second hydraulic pressure chamber in accordance with the rotational position of said cams.

4,534,324
VALVE CONTROL FOR A RECIPROCATING PISTON INTERNAL COMBUSTION ENGINE

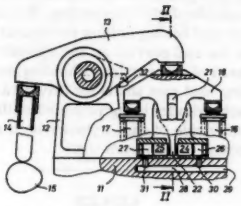
Herbert Deutschmann, and Hans Dinger, both of Friedrichshafen, Fed. Rep. of Germany, assignors to MTU-Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Sep. 19, 1983, Ser. No. 533,452

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313225

Int. Cl.³ F01L *1/26*

U.S. Cl. 123—90.22 **6 Claims**



6. A valve control for a reciprocating piston internal combustion engine in which at least two valves per cylinder head are actuated in unison by a traverse means displaced by a rocker arm means, and in which the traverse means is pivotally constructed, characterized in that

a bolt means operable to guide the traverse means rectilinearly is rotatably arranged at the cylinder head transversely to the connecting line of the valves,

in that the bolt means is rotatable by the traverse means by way of a rectilinear guide means,

in that the bolt means cooperates with a self-adjusting torque support means,

in that a means for eliminating clearance in the valve control is operatively interconnected between a cam shaft initiating the valve actuation and the traverse means and in that

a lever means non-rotatably connected with the bolt means and two oil pressure actuated pistons engaging mutually oppositely at the lever means form the torque support means.

4,534,325
CAM SHAFT HOLDING SYSTEM FOR INTERNAL COMBUSTION ENGINE

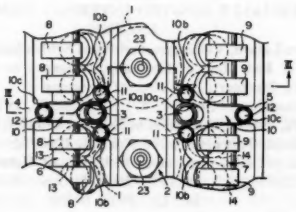
Fusatoshi Tanaka, Hiroshima, Japan, assignor to Mazda Motor Corporation, Japan

Filed Jul. 23, 1984, Ser. No. 633,441

Claims priority, application Japan, Jul. 27, 1983, 58-117681[U]

Int. Cl.³ F01L *1/02*

U.S. Cl. 123—90.27 **5 Claims**



1. A cam shaft holding system for an internal combustion engine in which a plurality of valves consisting of at least one

intake valve and at least one exhaust valve are positioned for each cylinder of the multicylinder engine and driven by cams secured to two cam shafts, wherein the improvement comprises:

(i) securing a cylinder head to a cylinder block by cylinder head mounting bolts positioned between adjacent cylinders,

(ii) extending said cam shafts adjacent to said cylinder head mounting bolts at positions outside said cylinder head mounting bolts and in the direction of the row of said cylinders,

(iii) positioning cam shaft holding members between said adjacent cylinders for rotatably supporting said cam shafts on said cylinder head,

(iv) each of said cam shaft holding members extending in the direction perpendicularly intersecting the axial direction of each cam shaft and having bolting portions at its end portions,

(v) at least the end portion on the cylinder head mounting bolt side of each of said cam shaft holding members for rotatably supporting said cam shafts for driving a plurality of said valves for each cylinder being provided with a single bolting portion on either side of each cylinder head mounting bolt in the axial direction of each cam shaft.

4,534,326

STOP/START ENGINE CONTROL FOR A ROAD VEHICLE

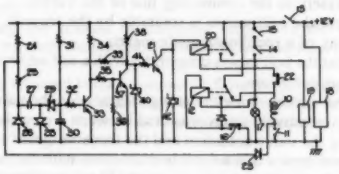
Roy P. Bowcott, Solihull, England, assignor to Lucas Industries, England

Filed May 7, 1984, Ser. No. 607,470

Claims priority, application United Kingdom, May 7, 1983, 8312651

Int. Cl.³ F02N *17/00*

U.S. Cl. 123—179 B **8 Claims**



1. A stop/start engine control for a road vehicle comprising means for stopping the engine, means for re-starting the engine and engine running sensitive means for inhibiting said re-starting means when the engine is running, characterised by latch means which is set when said engine stopping means is actuated and inhibits operation of the re-starting means as long as it remains set, accelerator pedal sensitive means for resetting the latch means when the accelerator pedal is moved out of its rest position whilst the latch means is in its set position, and clutch pedal sensitive means for operating said restarting means when the latch means is in its reset condition.

4,534,327

EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINE

Reinhard Latsch, Vaihingen, and Hans Schlembach, Mühlacker, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 871,577, Jan. 23, 1978, Pat. No. 4,218,992, which is a division of Ser. No. 688,051, May 19, 1976, abandoned. This application Apr. 22, 1980, Ser. No. 142,804

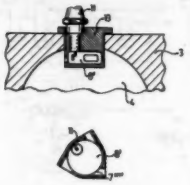
Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522577; Feb. 13, 1976, 2605738; Apr. 10, 1976, 2615813

Int. Cl.³ F02B *19/08*

U.S. Cl. 123—263 **4 Claims**

1. In an internal combustion engine which includes a housing, means in said housing defining at least one main combustion chamber, a drive piston associated with each main combustion chamber and defining a limiting surface of the main combustion chamber, the improvement comprising:

an ignition chamber including a cylindrical inner wall acting alone as a counter electrode associated with the main combustion chamber, and at least one connecting channel leading from the main combustion chamber to the ignition chamber, said at least one connecting channel passing through said cylindrical wall in a straight line and extending at a tangent with said cylindrical inner wall of said ignition chamber; a removable insert that extends into said main combustion chamber of said engine in which said ignition chamber is contained, said insert being removably placed in said engine housing and being capable of accepting external ignition means and including said channel for communication between said ignition chamber and said main combustion chamber in which the direction of gaseous flow through said channel is substantially radial with respect to the central axis of said insert, a spark ignition device mounted in said removable insert and including an ignition electrode eccentrically located relative to said counter-electrode so that said spark ignition device forms a spark gap which lies adjacent a closest portion of said counter-electrode of said ignition chamber and in a boundary layer formed by a combustible mixture flowing within said ignition chamber, so that the ignition spark penetrates the boundary layer adjacent said cylindrical ignition chamber wall, wherein the entire combustible mixture is delivered to the main combustion chamber, and a portion of said mixture is forced back through said at least one connecting channel to the ignition chamber by said drive piston during its compression stroke, thereby forming said boundary layer.



4,534,328

EMERGENCY CONTROL APPARATUS FOR A DIESEL ENGINE

Werner Fischer, Ditzingen; Ulrich Flaig, Markgröningen, and Johannes Locher, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 30, 1982, Ser. No. 403,903

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130094

Int. Cl.³ F02M *59/20*; F02D *31/00*

U.S. Cl. 123—359 **8 Claims**

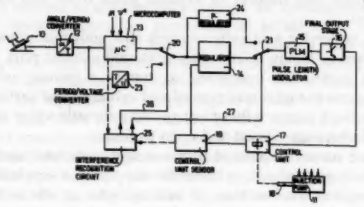
1. In a fuel metering system of a diesel engine having a fuel pump and a fuel-quantity setting member, a series circuit including: a drive pedal position sensor, a signal processing unit connected to the drive pedal position sensor, a regulating device connected to the signal processing unit and a control unit connected to the regulating device and the fuel quanity setting member, the improvement comprising,

a first emergency circuit for said signal processing unit and a second emergency circuit for said regulating device,

means for recognizing a malfunction in at least one of the signal processing unit and the regulating device and

means for switching either said first or said second emer-

gency circuit into the series circuit in response to the recognition means, whereby the malfunctioning of the



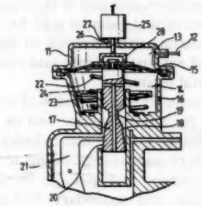
signal processing unit or the regulating device can be bypassed separately in said series circuit.

4,534,329

SUPPLY SYSTEM FOR SUPER CHARGED DIESEL ENGINES

Giorgio Filtri, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Italy

Filed Oct. 31, 1983, Ser. No. 547,556
Claims priority, application Italy, Nov. 11, 1982, 68322 A/82
Int. Cl.³ F02D *7/00*
U.S. Cl. 123—383 **2 Claims**



1. A fuel supply system for a supercharged diesel engine, comprising, in combination:

(a) a turbo compressor (**14**) operated by exhaust gas from the engine,

(b) an induction manifold (**9**) connected between said turbo compressor and the engine,

(c) an injection pump (**10**) connected to the engine,

(d) a fuel delivery regulator (**11**) connected to said pump and to said manifold and with said regulator being responsive to pressure in said manifold,

(e) control means (**25**) for said regulator and with said control means being actuatable to significantly increase the delivery of fuel to the engine by said pump,

(f) an accelerator pedal (**31**) movable through an open range of positions between upper and lower limits,

(g) a controller (**30**) connected to said control means (**25**) and responsive to passing of said accelerator pedal (**31**) downwardly past a predetermined position in said open range of positions to thereby actuate said control means (**25**),

(h) said predetermined position of said accelerator pedal (**31**) being closely adjacent said lower limit,

(i) and a three-way two-position electrically operated time delay valve (**32**) disposed in the connection between said induction manifold (**9**) and said fuel delivery regulator (**11**),

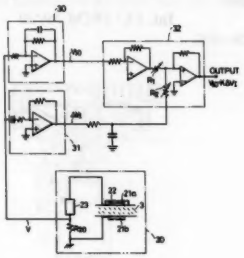
(j) said valve (**32**) providing means actuatable to temporarily interrupt the said connection between said manifold and said regulator and to simultaneously connect said regulator (**11**) to atmosphere.

4,534,330

AIR/FUEL RATIO DETECTOR

Minoru Osuga, and Yoshishige Oyama, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 31, 1984, Ser. No. 575,666
Claims priority, application Japan, Feb. 4, 1983, 58-16037
Int. Cl.³ F02B *3/00, 75/10;* F02M *7/00, 23/04*
U.S. Cl. 123—440 **6 Claims**



1. An air/fuel ratio detector comprising:

a sensor using a current source for generating an output signal corresponding to an air/fuel ratio;

means for detecting a changing current component within the output signal from said sensor on the basis of the change of the air/fuel ratio with respect to time; and

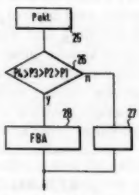
means for compensating said output signal from said sensor by causing a correction of said output signal by subtracting a high frequency signal component within the detected current in said sensor output from a low frequency of said detected current component.

4,534,331

CONTROL DEVICE FOR A FUEL METERING SYSTEM OF AN INTERNAL COMBUSTION ENGINE

David van Belzen, Hemmingen; Günter Hönig, Ditzingen; Gerhard Lotterbach; Jan-Faas van Woudenberg, both of Markgröningen, and Udo Zucker, Güglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 411,225, Aug. 25, 1982, abandoned.
This application Jul. 6, 1984, Ser. No. 627,486
Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216983
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—492 **16 Claims**

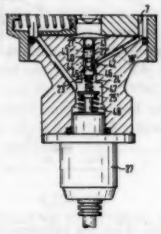


1. A control device for a fuel metering system of an internal combustion engine comrising means for sequentially determining load values, n, made successively in time, and a computer for the generation of fuel metering signals dependent on operational parameters, further including means for interrogating at least four successive load values occuring in sequence as to their tendency wherein a sequential rising tendency of said at least four successive load values corresponding to an acceleration triggers an acceleration enrichment.

4,534,332
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES WITH AN ADJUSTMENT OF THE INSTANT OF INJECTION

Franz Eheim, and Helmut Laufer, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,944
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1982, 3203583
Int. Cl.³ F02M 59/20
U.S. Cl. 123—502 **6 Claims**



1. A fuel injection pump for internal combustion engines provided with means for adjusting injection timing, said means comprising an adjusting piston disposed in a cylinder, a first end face of said adjusting piston defining with said cylinder a work chamber, said work chamber being pressurized by a fluid communicated from a pressure source, said pressurized fluid serving as a restoring force to said adjusting piston, said pressure source further being connected to a first pressure control device, and said pressure control device serving to vary the pressure applied to said fluid in accordance with at least one engine operating parameter, characterized in that a throttle cross section is disposed between said work chamber and said pressure source with constant communication therebetween, and said work chamber is provided with a relief line having a discharge cross section variable in accordance with at least one further other engine operating parameter, said discharge cross section being controlled by a control piston displaceable in response to the pressure in said work chamber counter to a spring, said spring being further retained on a support point displaced by an adjusting drive means in accordance with said at least one further other engine operating parameter, said control piston being disposed in a cylinder and including a first end serving to define a pressure chamber and a second end face acted upon by a spring, said pressure chamber being arranged to communicate via a bore with said relief line upstream of said discharge cross section, said control piston further including a control edge for controlling said discharge cross section and being provided with an annular groove and a recess connected therewith, said recess having a cross section and a longitudinal extent, said cross section varying over said longitudinal extent, and said recess cooperating with a control edge of said cylinder to form said discharge cross section.

4,534,333
INTERNAL COMBUSTION ENGINE WITH AIR-FUEL MIXTURE HEATING

Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 452,913, Dec. 27, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 668,185
Int. Cl.³ F02M 31/00
U.S. Cl. 123—545 **2 Claims**

1. In an internal combustion engine, the combination comprising:

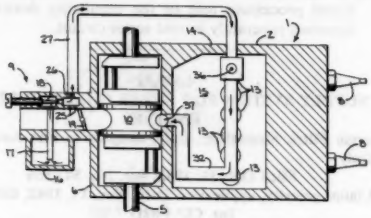
(a) a cylinder block having a cylinder and reciprocable piston disposed therein, said cylinder having a wall with an intake port and an exhaust port therein,

(b) an exhaust chest disposed in said cylinder block for receipt and transfer of exhaust gases from said exhaust port,

(c) a cover for said exhaust chest and with said cover disposed in facing relationship with said exhaust port,

(d) a carburetor connected to supply a primary air-fuel mixture to said intake port of said cylinder, said carburetor having a primary fuel passage and a throttle valve adjustable between closed and open positions,

(e) and means connected between said carburetor and said intake port of said cylinder for supplying a supplemental heated air-fuel mixture to said cylinder at idle and low engine speeds,



(f) said supplemental air-fuel mixture supplying means including passage means disposed in facing relationship with said exhaust port of said cylinder wall for conducting said supplemental mixture therethrough so that exhaust emanating from said exhaust port into said exhaust chest heats said supplemental mixture,

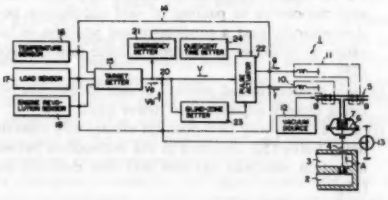
(g) said passage means is disposed in said cover having one end connected to said carburetor and its other end connected to said intake port of said cylinder, and

(h) the connection of said passage means to said carburetor includes a secondary fuel passage in said carburetor, means connecting said secondary fuel passage to said passage means in said cover, and external air inlet means disposed in said connecting means to provide said supplemental air-fuel mixture, said external air inlet means includes a restrictive air metering orifice of smaller cross section than said connecting means.

4,534,334
EXHAUST-GAS RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINE

Nobuaki Murakami, and Shogo Oomori, both of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1984, Ser. No. 580,084
Claims priority, application Japan, Feb. 18, 1983, 58-26021
Int. Cl.³ F02M 25/06
U.S. Cl. 123—571 **5 Claims**



1. An exhaust-gas recirculation system for an internal combustion engine comprising: an exhaust-gas recirculation pas-

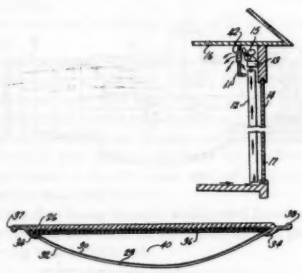
sage through which a portion of the exhaust gas from the internal combusion engine is sent back to an intake system, an exhaust-gas recirculation control valve disposed in said passage, valve actuating means for actuating said control valve in such a manner to continuously control the opening thereof, a valve opening sensor for generating an actual valve opening signal corresponding to the actual opening of said control valve, detecting means for detecting certain operating conditions of the internal combustion engine, and a main control device for supplying an output signal to said valve actuating means, said main control device having means for setting a desired opening amount of said control valve based on a signal sent from said detecting means, comparing means for detecting a difference between the desired opening amount and the actual valve opening detected by said valve opening sensor, sensing means for sensing, judging and setting a sudden change in the desired opening amount, means for setting a given length of quiescent time, and pulse actuating means for supplying actuating signals to said valve actuating means and operative to withhold the supply of the next actuating signal during the quiescent time preset by said quiescent time setting means after said pulse actuating means supplies an actuating signal the length of which corresponds to the difference detected by said comparing means and operative when the desired opening amount changes suddenly and in response to a signal from said sensing means to supply immediately a new actuating signal the length of which corresponds to a new difference.

4,534,335

SOLAR HEAT COLLECTOR AND REFLECTOR

Frederick H. Rice, P.O. Box 643, La Quinta, Calif. 92253

Filed Aug. 1, 1983, Ser. No. 519,019
Int. Cl.³ F24J 3/02
U.S. Cl. 126—429 **5 Claims**



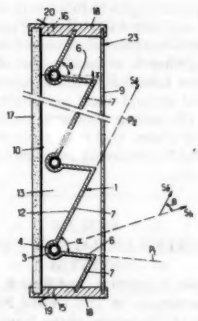
1. A solar heat collector and reflector system adapted to be disposed across an open window area in a room, said system comprising a series of fins all mounted for rotational movement through an arc of 180 degrees about parallel axes each fin being formed of a pair of first and second panels, one of which panels is a plastic glazing having an inner radiation diffusing, sawtooth surface which diffuses light passing therethrough, and the other of which panels has an outer reflective surface and an inner radiation absorbing surface facing said inner sawtooth surface of said plastic glazing, whereby said sawtooth surface obscures the view of said inner radiation absorbing surface while permitting light to reach said radiation absorbing surface, and said first of said panels in each pair is equipped with slotted lip means adapted to receive a lengthwise edge of said second panel to hold said second panel in a resiliently deformed condition flexed outwardly away from said first panel to define a chimney flue between said panels in each pair, and said lengthwise edge is held in said slotted lip means by spring pressure of said second panel, and the lengthwise edges of said first panel are both beaded and are adapted for mutual engagement to interlock with the beaded edges of the first panel of fins adjacent thereto to seal off any open space between adjacent fins, thereby providing a continuous curtain across said open window area when said fins are rotated to their extreme positions of rotation, means defining a heat reservoir located above said fins for collecting the accumulated heat from each fin, a fan located in said heat reservoir and powered by a photovoltaic panel which is located in a slave fin to disperse the concentrated heated air from said reservoir into the room, and means for collectively rotating said fins about their axes to vary the angular orientation of said fins toward the sun thereby regulating the solar heated hot air flow into the room from said heat reservoir.

4,534,336

SOLAR COLLECTORS

Serje Ladriere, Avenue du Cap Roux, Eze-sur-Mer, France

PCT No. PCT/FR83/00215, § 371 Date Jun. 22, 1984, § 102(e) Date Jun. 22, 1984, PCT Pub. No. WO84/01815, PCT Pub. Date May 10, 1984
PCT Filed Oct. 25, 1983, Ser. No. 626,853
Claims priority, application France, Oct. 25, 1982, 82 17805
Int. Cl.³ F24J 3/02
U.S. Cl. 126—431 **7 Claims**



1. A solar collector adapted to heat a heat-carrying fluid comprising:

a heat absorbing wall formed by: (a) a plurality of panels which are integrally made of a heat conducting material with adjacent panels sloping with respect to each other in a saw-tooth configuration so as to form alternating acute and obtuse dihedrons with respect to incident solar radiation, said two adjacent panels defining an acute dihedron forming therebetween an angle at least equal to the angle between the winter solstice and the summer solstice at the place where the collector is designed to be installed and being operatively situated in planes directed respectively toward the respective solstices; and (b) an integrally formed gutter in the region of the apex of each acute dihedron, each said gutter opening toward the inside of the dihedron; and

a plurality of heat conducting ducts formed of a heat conducting material in which the heat-carrying fluid flows, each said duct having a shape adapted to be closely received in a respective said gutter in heat conducting contact therewith.

4,534,337

SOLAR-ENERGY COLLECTOR

Gösta Janson, Badvägen 7-9, S-139 00 Värmdö, Sweden

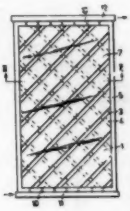
PCT No. PCT/SE83/00134, § 371 Date Nov. 3, 1983, § 102(e) Date Nov. 3, 1983, PCT Pub. No. WO83/03660, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 13, 1983, Ser. No. 557,291

Claims priority, application Sweden, Apr. 14, 1982, 8202322

Int. Cl.³ F24J 3/02

U.S. Cl. 126—445 3 Claims



1. A solar-energy collector having an absorber unit which comprises two plates (1, 2) of rigid material having the requisite resistance to corrosion and heat, said plates being sealingly connected together around their peripheries to form an intermediate, wide, elongate cavity of low height for a medium to be heated, and which is provided at two mutually opposite ends with inlet and outlet openings (10) for said medium, wherein the two plates are wave-formed (3, 4) over at least substantially the whole of their surfaces in mutually crossing directions, and the waves of the respective plates are oriented at equal but opposite angles in relation to the main direction of flow (H) of the medium; and in that the plates abut each other at those locations where the waves cross each other, the plates being joined together at at least a part of said locations, by welding, adhesive bonding or the like, and wherein the two plates are joined around their peripheries with a common ring-like frame (5) having abutment surfaces adapted to the wave-form of the plates, said frame also being provided with abutment surfaces for receiving front and rear cover plates (7, 9) for the collector.

4,534,338

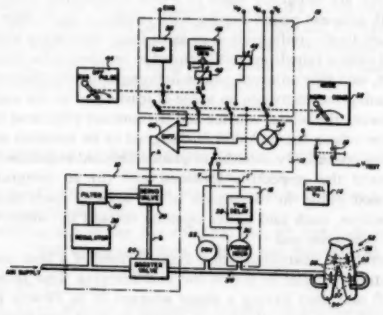
SERVO OPERATED ANTI-G SUIT PRESSURIZATION SYSTEM

Richard J. Crosbie, Langhorne, and Paul R. Edwards, Chalfont, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1984, Ser. No. 613,497

Int. Cl.³ A61F 5/37

U.S. Cl. 128—1 A 11 Claims



1. In an aircraft, a system for rapidly pressurizing and controlling pressurization of an aircrewman's anti-G suit, of the type, having a plurality of inflatable air bladders, comprising:

an accelerometer for providing a signal representative of G-forces incident along the vertical axis of the aircraft;

means for switching between two system operating modes, the first operating mode providing a first set of input signals, and the second operating mode providing a second set of input signals different from the first set;

multiple input control means responsive to the G-force signal and the first or second set of input signals for providing a control signal;

a control valve responsive to the control signal and formed to be connected for controlling the volume of air supplied to the anti-G suit; and

means responsive to the air pressure supplied to the anti-G suit and formed to be connected at the outlet of said control valve, for providing a feedback signal connectable through said switching means to said control means.

4,534,339

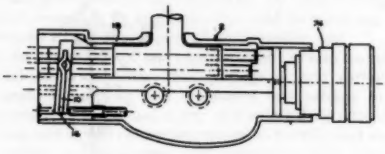
ENDOSCOPE

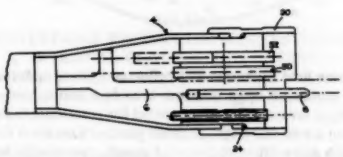
Ian P. Collins, Welwyn, and Douglas P. Fernie, Thriplow, both of England, assignors to Warner-Lambert Technologies, Inc., Dallas, Tex.

Filed Oct. 17, 1983, Ser. No. 542,611

Int. Cl.³ A61B 1/00

U.S. Cl. 128—6 29 Claims





1. An endoscope having a handle, a shaft with a flexible length terminating in a distal end, a proximal end of the shaft having a coupling face for detachable connection to a coupling face of the handle and the distal end of the shaft being arranged to receive an optical image of a subject to be viewed, flexure control means operable on the handle for effecting controlled flexing of the shaft, first coupling means for mechanically coupling the shaft and handle, the first coupling means being capable of being released to allow the shaft and handle to be separated, second coupling means for transmitting illuminating light from the handle to the shaft, third coupling means for transmitting an optical image from the shaft to the handle, and fourth coupling means for transmitting from the handle to the shaft movement providing for the controlled flexing of the shaft.

4,534,340

COMBINATION HANDLE

Ronald R. Kerr, deceased, late of Fort Collins, Colo. (by Blanche S. Kerr, executrix); David W. Smith, and John M. Trenary, both of Fort Collins, Colo., assignors to Teledyne Industries, Inc., Fort Collins, Colo.

Filed Aug. 1, 1983, Ser. No. 519,145
Int. Cl.³ A46B *13/06*
U.S. Cl. 128—66 **2 Claims**

1. Oral hygiene apparatus comprising: a source of a succession of liquid pulses;
an elongated, hollowed handle of a size and shape to be grasped by the human hand;
means for delivering said pulses into the interior of said handle;
a nozzle for delivering said pulses against the teeth and gums of the user;
means for mounting said nozzle to said handle for receiving said pulses;
a toothbrush for scrubbing said teeth and massaging said gums;
means for mounting said toothbrush to said handle;
means included within said handle for moving said toothbrush relative to said handle in response to said pulses;
a valve disposed within said handle and actuatable automatically upon mounting of said nozzle to said handle for conveying said pulses only into said nozzle, said valve being actuated by the inner end of said nozzle upon its insertion into said handle;
and said valve being located within said handle in a position to be biased into its closed position by said pulses when so moving said toothbrush.

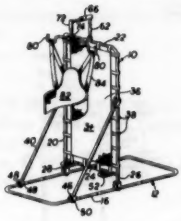
4,534,341

GRAVITY LUMBAR REDUCTION MAINTENANCE APPARATUS

Gordon B. Bart, Sturgis; Carol L. Hiemstra, Spring Arbor, and James H. Tyo, Jackson, all of Mich., assignors to Camp International, Inc., Jackson, Mich.

Filed Jun. 6, 1983, Ser. No. 501,508
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—75 **6 Claims**

1. Gravity lumbar reduction maintenance apparatus capable of being oriented to the vertical in a plurality of positions compsiring, in combination, a tubular base formed in a planar rectangular configuration having parallel sides and parallel ends, a tubular body frame formed in a planar rectangular configuration having parallel sides and parallel first and second ends, said body frame first end defined by an upper tubular cross piece and said body frame second end defined by a lower tubular cross piece, said body frame parallel sides each extending beyond said second end cross piece terminating in a free end, a yoke mounted upon each free end having spaced legs having aligned holes therein for receiving a pin, a plurality of first spaced connection means defined in said base sides, second connection means defined on said frame sides, a body supporting web affixed to said frame extending between said sides thereof, and at least a pair of primary links each having ends having connection means defined thereon associated with said base and said frame connection means to maintain a preselected angular relationship between said base and frame, the connection means on one end of a link cooperating with said first connection means on said base and the connection means on the other end of a link cooperating with said second connection means on said frame, said yokes being selectively connectable to said second connection means.

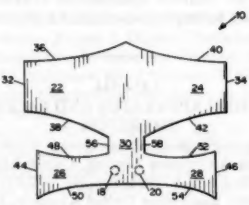


4,534,342

NOSE BANDAGE

Charles Paxa, 1200 Lyan Ave., Wayzata, Minn. 55391

Filed Mar. 28, 1984, Ser. No. 594,208
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—163 **5 Claims**

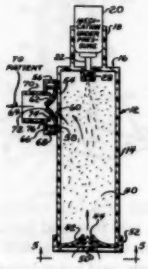


1. Nose bandage formed of a flexible material comprising:
a. opposing infra orbital portion means of a predetermined trapezoidal like geometrical shape;
b. opposing side arm means of trapezoidal like shape, the side arm means being smaller in geometrical size than said opposing infra orbital portion means;
c. connecting bridge of a geometrical rectangular like shape between said opposing infra orbital portion means and said opposing side arm means in a mid portion thereof;
d. at least two perforated nasal passage holes located in a substantially mid center portion of said side arm means; and,
e. adhesive means with protective backing secured to one side of continuous material of said orbital portion means, said side arm means, said connecting bridge means, and said nose bandage means whereby said adhesive means secures said nose bandage about a nose of an individual thereby providing a one piece nose bandage for unilateral or bilateral nasal occlusions.

4,534,343
METERED DOSE INHALER

Christopher Nowacki, Arlington Heights, and Alfred G. Brisson, Schaumburg, both of Ill., assignors to Trutek Research, Inc., Arlington Heights, Ill.

Filed Jan. 27, 1984, Ser. No. 574,340
Int. Cl.[3] A61M 15/00
U.S. Cl. 128—200.23 9 Claims

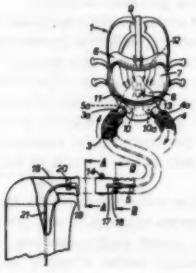


1. A metered dose inhaler for administering asthmatic medication comprising an upright cylindrical air chamber adapted to be held in the hand, said air chamber having an upper end and a lower end, means adjacent said upper end for supporting a pressurized cartridge of asthmatic medication, means for establishing fluid communication from said cartridge into said air chamber adjacent the upper end thereof for spraying a measured dose of medication into said air chamber, a one way valve adjacent the lower end of said air chamber for admitting air but retaining medication, a mouthpipe disposed laterally of said air chamber adjacent the upper end thereof for receipt in a patient's mouth, said air chamber opening into said mouthpipe, and one way valve means between said air chamber and said mouthpipe to pass misted medication from said air chamber through said mouthpipe and into said patient upon patient inhalation and to preclude entrance of air through said mouthpipe into said air chamber upon patient exhalation, said one way valve means having bypass means for venting exhaled air to atmosphere.

4,534,344
BREATHING APPARATUS AND FACEMASKS THEREFOR

Trevor Constance-Hughes, Abergavenny, Wales, assignor to Siebe Gorman & Company Limited, United Kingdom

Filed Feb. 8, 1984, Ser. No. 578,079
Claims priority, application United Kingdom, Feb. 16, 1983, 8304261
Int. Cl.[3] A62B 7/00
U.S. Cl. 128—201.15 9 Claims

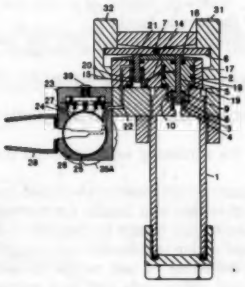


1. A facemask for breathing apparatus, comprising: an outer mask arranged in use to define with the face of a wearer a volume over the eyes of the wearer that is sealed from the external atmosphere; an inner mask arranged in use to define with the face of the wearer a volume over the mouth and/or nose of the wearer that is sealed both from the interior of the outer mask and from the external atmosphere; first inlet and outlet means to permit a gas to enter the inner mask from the exterior of the facemask and leave the inner mask to the exterior of the facemask; second inlet means to permit a gas to enter the outer mask from the exterior; connectors for gas pipes or tubes provided at the exterior of the facemask, at least one of the connectors being in communication with the first inlet and outlet means and another of the connectors being in communication with the second inlet means; and a one-way valve to permit a gas to flow from the interior of the outer mask to the interior of the inner mask.

4,534,345
DOSAGE INHALATOR

Kjell I. L. Wetterlin, S Sandby, Sweden, assignor to Aktiebolaget Draco, Sodertalje, Sweden

Filed Jun. 30, 1982, Ser. No. 393,720
Claims priority, application Sweden, Jul. 8, 1981, 8104240
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[3] A61M 15/00
U.S. Cl. 128—203.15 14 Claims



1. An inhaler for administering to a patient a pharmacologically active solid in a dry micronized powder having a particle size of less than 5 micrometers suspended in a propellant comprising:

a gas conduit through which a dose of said solid suspended in said propellant is supplied to said patient, a storage chamber for said solid, a perforated membrane having a plurality of preselected portions each adapted to hold and dispense a reproducible unit dose less than 50 mg of said solid, and a propellant supply unit for supplying a pharmacologically acceptable propellant to the inhaler,

said conduit, membrane and propellant supply unit being operably connected to each other so that propellant released from the propellant supply unit passes through one of said preselected portions of said perforated membrane that is positioned across said gas conduit, releases said solid carried thereby, and carries said solid as a suspended solid through said gas conduit to the patient,

wherein said perforated membrane is adapted to be displaceable through a plurality of positions in each of which another preselected portion thereof holding a reproducible dose of said solid is moved into a dispensing position relative to said gas conduit and propellant supply unit, and another portion thereof is moved into said storage chamber, and

wherein said chamber includes means operably disposed relative to the position of said perforated membrane in said storage chamber for introducing said reproducible

amount of said active solid into the perforations of said membrane,

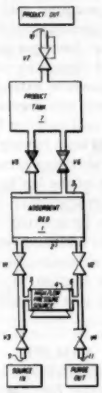
whereby reproducible doses of the solid can be transferred from said storage chamber by said membrane, positioned across said gas conduit by said membrane, and removed therefrom by propellant discharged from said propellant supply unit.

4,534,346

PRESSURE SWING CYCLE FOR THE SEPARATION OF OXYGEN FROM AIR

John Schlaechter, Grandview, Ohio, assignor to Guild Associates, Inc., Worthington, Ohio

Filed Mar. 15, 1983, Ser. No. 475,543
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—205.12 **5 Claims**



4. A method for the essentially continuous therapeutic delivery of a source of purified oxygen to a patient consistent with an anticipated physiological need of an individual patient consisting of:

(A) derriving an enriched supply of oxygen from a serially interconnected

(1) a source inlet communicating with ambient air;

(2) a purge outlet communicating with ambient air;

(3) a compressor having an inlet and an outlet for providing a pressure difference with respect to an ambient pressure level;

(4) a two ended bed containing a purgeable adsorbent having a selective affinity for gas other than oxygen; and

(5) a product vessel having an outlet and pressure regulating means in said outlet for the delivery of purified oxygen; the serial interconnection between said source inlet, purge outlet compressor, bed and vessel comprisng gas flow path means connected between: (a) the vessel and one bed end, (b) the other bed end and the compressor inlet and outlet (c) the compressor inlet and the source inlet and (d) the compressor outlet and the purge outlet;

(B) valve means in said gas flow path means comprising separately operable interconnecting valves being operated in a repeating cycle in which:

(1) in a first cycle stage the valves are operated to provide ambient air from the source inlet through the inlet of the compressor to introduce said air to one end of the bed at an elevated pressure, whereby gas other than oxygen is absorbed by the absorbent, and to deliver an oxygen enriched gas from the other end of the bed to the vessel; and

(2) in the second cycle stage the valves are operated to flow oxygen enriched gas from the vessel to the other end of the bed whereby the absorbent in the bed is purged of absorbed gas by a suction gas flow from the vessel in a reverse direction through the bed and from the one end of the bed to the inlet of the compressor and through the outlet of the compressor to said purge outlet;

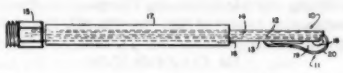
(C) continuously administering said enriched supply of oxygen to the patient.

4,534,347

MICROWAVE COAGULATING SCALPEL

Leonard S. Taylor, Silver Spring, Md., assignor to Research Corporation, New York, N.Y.

Filed Apr. 8, 1983, Ser. No. 483,219
Int. Cl.³ A61B *17/36*
U.S. Cl. 128—303.1 **40 Claims**



1. A surgical instrument for simultaneously cutting and coagulating tissue, said instrument comprising:

(a) means for generating microwave energy having a frequency selected from the range of 100 MH_z to 13,000 MH_z;

(b) a scalpel blade having a cutting edge for severing tissue, said blade also having a microwave radiator means therein for emitting microwave radiations in the proximity of said cutting edge;

(c) means for manipulating said scalpel blade which includes an insulating means to enable a surgeon to manipulate the cutting edge and obtain tactile feedback therefrom;

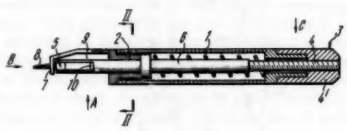
(d) insulated conductor means for transmitting said microwave energy to said microwave radiator means.

4,534,348

INSTRUMENT FOR MAKING CORNEAL INCISIONS

Svyatoslav N. Fedorov; Evgeny I. Degtev; Vladimir N. Golubev; Sergei V. Khromov; Igor A. Yatsenko; Alexandr A. Karavaev, and Vladimir M. Yakushev, all of Moscow, U.S.S.R., assignors to Moskovsky Nauchno-Issledovatelsky Institut Mirrokhirurgii Glaza, Moscow, U.S.S.R.

Continuation-in-part of Ser. No. 375,272, Apr. 21, 1982,. This application Jan. 10, 1983, Ser. No. 456,985
Claims priority, application U.S.S.R., Jan. 12, 1982, 3383704
Int. Cl.³ A61B *17/32*; B26B *1/08*
U.S. Cl. 128—305 **5 Claims**



1. An instrument for making corneal incisions, said instrument comprising:

a casing;

a holding means slidingly mounted within said casing for reciprocative motion relative to said casing;

a drive means for moving said holding means along the longitudinal axis of said casing;

a locking means positioned at one end of said holding means to releasably lock a cutting blade;

a spring means positioned at the other end of said holding means for biasing said holding means;

a forked stop means defined by said casing to limit the movement of said locking means and to slide along a corneal surface, said forked stop means including two tongs and defining an opening between said two tongs to permit egress of said cutting blade;

said locking means including a rectangular-shaped groove having a base defined by said holding means, said base of said rectangular-shaped groove being positioned parallel to a plane passing equidistantly between said two tongs of said forked stopping means;

a spring-loaded lever clip mounted in said rectangular-shaped groove for biasing against the cutting blade; and

a space defined between said spring-loaded lever clip and said base of said rectangular-shaped groove for receiving said cutting blade.

4,534,349

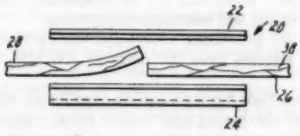
ABSORBABLE SUTURELESS NERVE REPAIR DEVICE

Thomas H. Barrows, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 436,242, Feb. 2, 1983, abandoned. This application Jan. 12, 1984, Ser. No. 569,557

Int. Cl.³ A61B *17/04*

U.S. Cl. 128—334 R **11 Claims**



1. A medical device for use in the sutureless repair of a nerve comprising a longitudinally-openable, porous, rough-surfaced tube of at least one body-absorbable polymer, said tube having a porosity in the range of 25 to 95 percent by volume, a coefficient of static friction, μ_s, in the range of 0.40 to 0.90, and being capable of enclosing, holding in approximation, and protecting the ends of a severed or lacerated nerve.

4,534,350

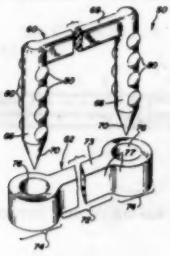
TWO-PIECE TISSUE FASTENER WITH COMPRESSIBLE LEG STAPLE AND RETAINING RECEIVER

Donald M. Golden, Cherry Hill, N.J., and William P. McVay, Clearwater, Fla., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jun. 20, 1983, Ser. No. 506,082

Int. Cl.³ A61B *17/04*

U.S. Cl. 128—334 C **2 Claims**



1. A fastener adapted to hold together two portions of mammalian tissue, such as are defined by a wound or incision, to facilitate healing of the wound or incision, said fastener comprising:

a generally U-shaped fastening member, said fastening member comprising a pair of generally conical distal ends adapted to penetrate said tissue portions and a link normal to, extending between, and connecting said legs; said link being adapted to lie substantially against one of said tissue portions; each said leg being generally cylindrical and having on its exterior along at least a portion of its length two rows of resilient convex members, each convex member defining an increased cross section region presenting a three dimensionally curved engaging surface separated from adjacent members by cylindrical cross section regions of said leg, each row of convex members on a leg being oriented about 180 degrees from the other row on that leg and each convex member in one row on the leg being in longitudinal registry along the leg with a convex member in the other row on that leg; and

a receiver having a first leg receiving member for receiving one of said fastening member legs after said legs have been inserted through said tissue portions and having a second leg receiving member for receiving the other of said fastening member legs after said legs have been inserted through said tissue portions; said receiver having a first side adapted to be disposed against the other of said tissue portions; said receiver having a second side facing generally away from said first side; said receiver having an exterior peripheral surface extending between said first and second sides; each said receiving member defining a bore extending from said receiver first side to said receiver second side; each said bore having a substantially uniform diameter, said diameter being greater than the cylindrical cross section regions of the leg to be inserted therein but smaller than the corresponding increased cross section regions of the leg to be inserted therein whereby, when the leg is inserted into said receiving member, said convex members deform to accommodate the insertion and provide an interference friction fit to retain the fastening member and receiver in a selected relative position.

4,534,351

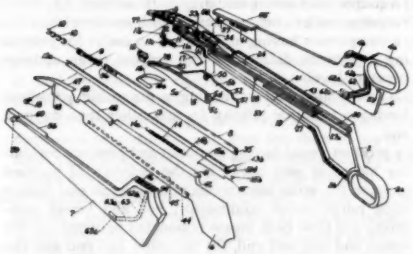
LIGATOR

Robert G. Rothfuss, Bellevue, Ky.; David K. Kuhl, Cincinnati, Ohio; Federico Bilotti, Madeira, Ohio; Hugh Melling, West Chester, Ohio, and Earl J. Mills, Cincinnati, Ohio, assignors to Senmed, Inc., Cincinnati, Ohio

Filed Oct. 20, 1982, Ser. No. 435,380

Int. Cl.³ A61B *17/04*; B31B *1/00*

U.S. Cl. 128—334 R **30 Claims**



1. An instrument for applying ligating clips to blood vessels, said instrument comprising a first handle terminating at its forward end in a first jaw, a second handle and a second jaw both pivotally mounted on said first handle near said forward end thereof, said first and second handles being manually shiftable between open and closed positions, said first jaw being shiftable by said first handle and said second jaw being shiftable by said second handle between open and closed clip-clamping positions, an elongated magazine within said first handle and extending longitudinally therein, a row of clips located within said magazine together with means constantly urging said row of clips toward said forward end of said maga-

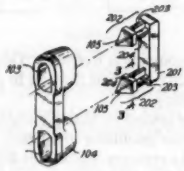
zine, a pusher being mounted within said first handle parallel to and adjacent to said magazine in a pusher track which extends to the forward ends of said first and second jaws, said pusher being shiftable by said first and second handles between a retracted position removed from said jaws when said handles are in their closed positions and an extended clip-locating position between said jaws when said handles are in their open positions, a ramp in said first handle at the forward end of said magazine and leading to said pusher track, said ramp being covered by said pusher when in its extended position and exposed by said pusher when in its retracted position to enable the forwardmost clip of said row to be transferred from said magazine to said pusher track under the influence of said urging means.

4,534,352

SURGICAL FASTENER MEMBER HAVING INCREASED RATE OF ABSORPTION

Herbert W. Korthoff, Wilton, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 4, 1983, Ser. No. 538,982
Int. Cl.³ A61B *17/08*
U.S. Cl. 128—334 C **5 Claims**



4. A surgical fastener member of a resinous material, comprising:

a base and substantially parallel prongs extending substantially perpendicularly from the base in substantially the same direction, each of the prongs having a shank which is joined at its proximal end to the base and a barb at the distal end of the shank for penetrating tissue, the shank having (1) a longitudinal core along substantially its entire length whose cross-sectional area is from about 15% to about 50% of the total radial cross-sectional area of the shank and (2) four fins projecting outward from the core at right angles to each other and extending substantially longitudinally along substantially the entire length of the shank.

4,534,353

ACCESSORY FOR COUNTERACTING THE CONSEQUENCES OF VESICAL INCONTINENCE WITH MALES

Eric J. A. de Leur, Sydwende 9, Drachten, and Berend Heijenga, Schaapstreek 42, Sleen, both of Netherlands

Filed Mar. 24, 1983, Ser. No. 478,448
Claims priority, application Netherlands, Mar. 17, 1983, 8201258
Int. Cl.³ A61B *19/00*
U.S. Cl. 128—346 **11 Claims**

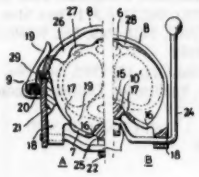
1. A pressure element for use in an applicance for counteracting the consequences of vesical incontinence in males, said pressure element applied in use to the underside of the penis and held thereto by a tensioning band that extends circumferentially around the penis, said pressure element comprising:

a first rigid member located to the right of the urethra;

a second rigid member located to the left of the urethra;

a pressing body located between said first rigid member and said second rigid member and including a convex pressing surface that faces the urethra for applying a radially inward force to the underside of the penis for compressing the urethra;

connecting means interconnecting said pressing body with said first rigid member and with said second rigid member and including surfaces of concave shape that face and cradle the corporae cavernosa, whereby the pressing



surface is maintained in alignment with and overlying the urethra; and,

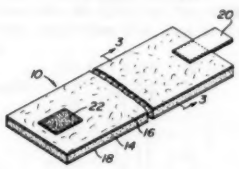
actuating means mounted to said first rigid member and mounted to said second rigid member and operatively engaging said pressing body for forcing said pressing body against the urethra under control of the user.

4,534,354

BANDAGE

Francis J. Bonner, Jr., and Francis J. Bonner, III, both of Radnor, Pa., assignors to Universal Medical Products, Inc., Radnor, Pa.

Filed Sep. 29, 1982, Ser. No. 426,406
Int. Cl.³ A61F *7/00*
U.S. Cl. 128—402 **28 Claims**



1. A method for the prevention of arcing in a spark erosion process, in which a pulse-shaped voltage is applied between an electrode and an electrically conducting workpiece, which voltage has a first, predetermined amplitude during a variable ignition retarding period determined by the process parameters, and on the termination of said ignition retarding period a discharge takes place between the electrode and the workpiece, resulting in the flow of a pulse-shaped current and in the voltage dropping to a second amplitude determined by the process, characterized by determining during each pulse interval whether a short circuit between the electrode and workpiece has occurred and, upon the detection of such a short circuit, permitting the next successive voltage pulse to be generated without being suppressed or terminated irrespective of the duration of the ignition retarding period exhibited by said pulse, sensing the ignition retarding period and terminating the voltage in response to the absence of a short circuit if the retarding period is less than a predetermined value; and characterized further in that on the termination of the ignition retarding period a first current of relatively low amplitude will flow for a first, relatively short period of time and that a second current of an amplitude a selected amount greater than that of said first current will be added to said first current in response to the ignition retarding period being found to exceed said predetermined duration.

4,534,355

ELECTROCHEMICAL SENSOR EMPLOYING A GAS-PERMEABLE HYDROPHILIC POLYURETHANE MEMBRANE

William D. Potter, Hertfordshire, England, assignor to Smith and Nephew Associated Companies Inc., England

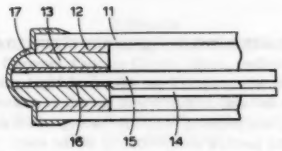
PCT No. PCT/GB81/00223, § 371 Date Mar. 26, 1982, § 102(e) Date Mar. 26, 1982, PCT Pub. No. WO82/01306, PCT Pub. Date Apr. 29, 1982

PCT Filed Oct. 13, 1981, Ser. No. 364,864

Claims priority, application United Kingdom, Oct. 15, 1980, 8033313

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—635 **10 Claims**



1. In an electrochemical sensor for use in determining blood gas which employs a membrane of material permeable to the blood gas to be determined, the improvement which comprises employing as the membrane a membrane which consists essentially of a hydrophilic linear polyether polyurethane.

4,534,356

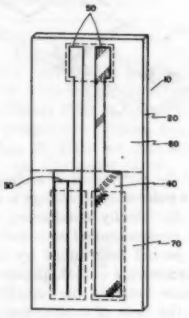
SOLID STATE TRANSCUTANEOUS BLOOD GAS SENSORS

Nicholas Papadakis, Mentor, Ohio, assignor to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Jul. 30, 1982, Ser. No. 403,808

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—635 **15 Claims**



1. A solid state transcutaneous oxygen sensor comprising:
(a) an electrically insulating substrate;
(b) a first electrode comprising a noble metal on said substrate of (a);
(c) a second electrode comprising a silver/silver halide reference electrode on said substrate of (a);
(d) an insulating dielectric layer on said components (a), (b) and (c) characterized in that at least a portion of component (b) and component (c) remains exposed; and
(e) an oxygen permeable polymeric membrane containing a bound liquid electrolyte over at least said exposed portion of said first and said second electrodes;
(f) a polymeric oxygen permeable, liquid impermeable, biocompatible membrane coating over said oxygen permeable polymeric membrane containing a bound liquid electrolyte;
further characterized in that said exposed portions of said first and second electrodes have well-defined surface areas.

4,534,357

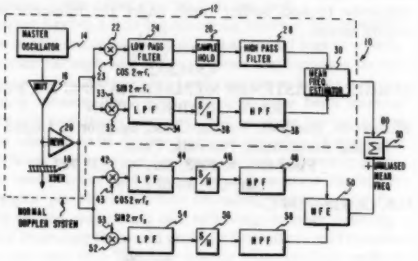
MULTIPLE DEMODULATION FREQUENCY DOPPLER

Jeffry E. Powers, Bainbridge Island, Wash., assignor to Advanced Technology Laboratories, Inc., Bellevue, Wash.

Filed Apr. 19, 1984, Ser. No. 601,815

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—663 **3 Claims**



1. A multiple demodulation frequency Doppler detector for measuring the velocity of blood flowing in a patient's circulatory system comprising:
(a) a first Doppler system including a master oscillator operating at a master oscillator frequency, a transmitter, a transducer, and a receiver, and means for generating a first sine wave and a first cosine wave having a first frequency which is said master oscillator frequency divided by a first integer;
(b) a second Doppler system using said master oscillator, said transmitter, said transducer, and said receiver, and means for generating a second sine wave and a second cosine wave having a second frequency, different from said first frequency, said second frequency being said master oscillator frequency divided by a second integer different from said first integer;
(c) said first Doppler system further includes means for detecting the mean Doppler frequency of said first Doppler system using said first sine wave and said first cosine wave;
(d) said second Doppler system further includes means for detecting the mean Doppler frequency of said second Doppler system using said second sine wave and said second cosing wave; and
(e) means for detecting the difference between said mean Doppler frequency of said first and second Doppler signals, whereby said difference will be the unaliased mean Doppler frequency.

4,534,358

NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS

Ian R. Young, Sunbury-on-Thames, England, assignor to Picker International Limited, Wembley, England

Filed Mar. 21, 1984, Ser. No. 591,697

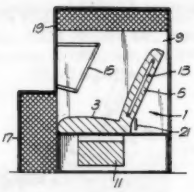
Claims priority, application United Kingdom, Mar. 30, 1983, 8308778

Int. Cl.³ A61B *5/05*

U.S. Cl. 128—653 **6 Claims**

1. A nuclear magnetic resonance imaging apparatus comprising: patient support means adapted to support a patient in a sitting posture; a magnet assembly means including two pole pieces, one on each side of the support means so as to apply a magnetic field directed substantially horizontally and perpendicularly to the forward looking direction of a patient seated in the support means, said pole pieces being connected by a yoke

so disposed as not to impede access to the support means from said direction; a first radio frequency coil means for application of radio frequency signals to a patient in said support means comprising one coil means positioned adjacent a back support part of said support means, and another coil means adapted for movement between a corresponding position in front of a



patient in the support means and a position removed therefrom to allow access to the support means from said direction; and a second radio frequency coil means for detection of radio frequency NMR signals produced in a patient in the support means and adapted for mounting adjacent the part of a patient to be imaged.

4,534,359

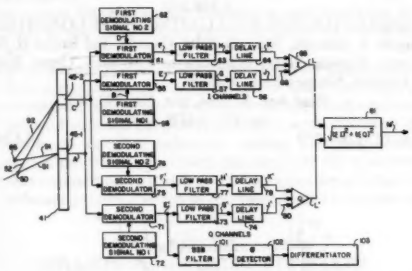
METHOD AND MEANS FOR DETERMINING FREQUENCY SELECTIVE TISSUE ATTENUATION IN A BASEBAND ULTRASONIC IMAGING SYSTEM

Stockton M. Miller-Jones, Cameron Park, Calif., and Stephen W. Flax, Waukesha, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 2, 1982, Ser. No. 446,347

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **2 Claims**



1. In a baseband medical ultrasonic imaging system in which transducer means receives reflected ultrasonic waves and generates input electrical signals and demodulator means mixes said input electrical signals with a demodulator signal to obtain a high resolution focused image signal, a method of determining frequency shift of said input electrical signals over a period of time comprising the steps of

filtering the output signals of said demodulator means to obtain a sideband signal of said mixed input signals and demodulator signal,

detecting phase change of said sideband signal, and

differentiating said detected phase change over said period of time.

4,534,360

DETECTION OF LUNG CANCER USING BREATH LUMINESCENCE

Martin D. Williams, 4317 Accomack Dr., Louisville, Ky. 40222

Filed May 27, 1983, Ser. No. 498,762

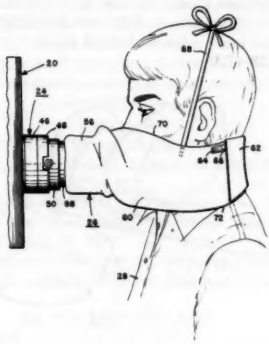
Int. Cl.³ G01N *33/10*

U.S. Cl. 128—665 **7 Claims**

1. A method of screening for lung cancer in a human patient comprising the steps of:

measuring the quantity of light spontaneously emitted by the patient's breath; and

comparing the quantity of light so measured with a preestablished standard for persons of the same age as the patient



who are free of lung cancer, whereby if the quantity of light emitted by the patient's breath is substantially below the preestablished standard, the patient is considered a candidate for further diagnostic testing.

4,534,361

METHOD AND APPARATUS FOR MEASURING BLOOD PRESSURE BY INSTANTANEOUS COMPARISON OF MULTIPLE FREQUENCY-RANGE COMPONENTS OF KOROTKOFF NOISE

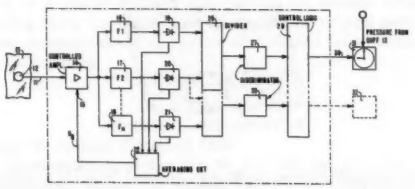
Klaus Berger; Karl-Heinz Affeldt, and Lutz Böttcher, all of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 29, 1982, Ser. No. 437,689

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1981, 3143372

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—680 **13 Claims**



7. Blood pressure measuring apparatus comprising

a pressure cuff (**13**);

a Korotkoff noise pick-up microphone (**12**);

controlled amplifier means (**14**) connected to and controlled by the microphone (**12**);

a plurality of frequency band-pass filters (**16, 17, 18**), each passing a predetermined band of frequencies (F1, F2 . . . Fn) within the Korotkoff noise spectrum;

quotient-forming means (**25, 26**) comparing the output amplitude from each two band-pass filters;

discriminator means (**27, 28**) connected to the quotient-forming means (**25, 26**) and determining if the quotients of the amplitude of the output of the band-pass filters connected to the quotient-forming means have a predetermined relationship;

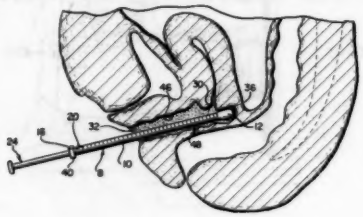
and a control logic (**29**) connected to and controlled by said discriminator means and providing an output in dependence on which one of the discriminator means, connected to which one of the pairs of band-pass filters, provides an output representative of said predetermined relationship.

4,534,362

METHOD AND APPARATUS FOR DETECTION OF FERTILITY

Gebhard F. B. A. Schumacher, Homewood, and Stephen J. Usala, Chicago, both of Ill., assignors to University Patents, Inc., Westport, Conn.

Filed May 7, 1982, Ser. No. 375,883
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—738 **41 Claims**



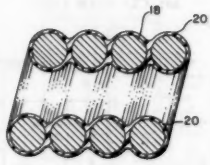
1. A method of detecting the fertile and infertile phases in the human menstrual cycle comprising:
daily collecting of cervico-vaginal fluid from the vagina over a period of days; and
determining the cyclic pattern of volumetric changes in said fluid over said period of days to indicate the phases in the cycle.

4,534,363

COATING FOR ANGIOGRAPHIC GUIDEWIRE

Philip Gold, Pompano Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Continuation of Ser. No. 372,900, Apr. 29, 1982, abandoned.
This application Apr. 26, 1984, Ser. No. 604,399
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—772 **6 Claims**



1. An angiographic guide wire adapted to guide a catheter into the body of a patient; said guide wire comprising: an elongate wire which has a circular cross-section and which is wound into a coil spring of consecutive adjacent coils; a proximal tip fixed ot one end of said coiled wire; a distal tip fixed to the other end of said coiled wire; a core wire fixed to and between the tips; and a thin continuous coating of low friction, slippery material completely encasing and interconnecting said coiled wire and the individual coils thereof, and extending between adjacent coils, said coating consisting essentially of an organosiloxane copolymer.

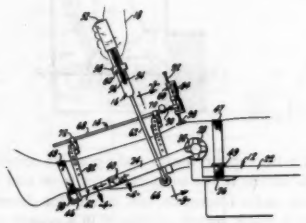
4,534,364

SAGITTAL KNEE TEST APPARATUS

Larry W. Lamoreux, 5470 Manila Ave., Oakland, Calif. 94618

Filed Sep. 19, 1983, Ser. No. 533,365
Int. Cl.³ A61B *6/00*
U.S. Cl. 128—774 **16 Claims**

1. Sagittal knee test apparatus comprising:
a. a leg support mechanism for supporting a patient's leg in a select angular position;
b. a hand held, manual force applicator adapted for selectively applying on anterior or posterior displacement force against the upper portion of the patient's tibia; and
c. a mechanical measuring device having a support structure with means for fastening said support structure to the anterior aspect of the patient's tibia, and a displacement instrument mounted to said support structure over the patient's patella, said displacement instrument including:
1. a contact member adapted to contact the patient's patella,



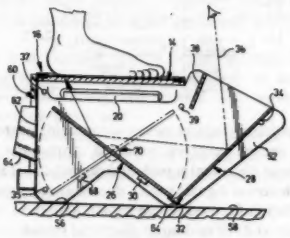
2. a coupling means for displaceably coupling said contact member to said support structure with said contact member being maintained in contact with the patella, and,
3. indicator means for indicating relative displacements between said coupling means and said contact member corresponding to relative displacements between said tibia and said patella upon application of anterior and posterior forces to the tibia by said force applicator.

4,534,365

APPARATUS FOR EVALUATING FOOT CONDITION

Angelo A. Bonetta, Niagara Falls, Canada, and Bruno R. Galiotto, Verona, Italy, assignors to Canadian Ursus Rubber Limited, Niagara Falls, Canada

Filed Apr. 5, 1984, Ser. No. 597,043
Int. Cl.³ A61B *5/10*
U.S. Cl. 128—779 **14 Claims**



1. Apparatus for evaluating a person's foot condition in terms of blood circulation in and/or anatomical shape of their feet comprising a transparent planar foot support mounted on a stand, said foot support having an upper surface, means for illuminating the underside of said transparent foot support, said foot support and stand receiving and supporting a device on which a barefooted person is adapted to stand indicating visually the condition of the feet of a person adapted to be standing on said device, a mirror system mounted beneath said foot support to enable unobstructed viewing of the underside of said transparent foot support by a person standing adjacent said stand, means for mounting a camera on said stand, said mirror system having a mirror rotatably mounted on said stand for rotation about an axis parallel with the plane of said foot

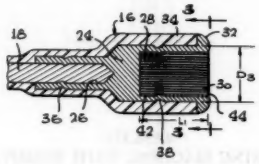
support, a first stop means to angle said rotatable mirror in a first position for viewing and second stop means to angle said rotatable mirror in a second position when isolated from said first stop means relative to a camera when present in said camera mounting means to enable photographing the visual indication of a person's foot condition.

4,534,366

CARBON FIBER PACING ELECTRODE

Thomas M. Soukup, 38233 Hendon Dr., Palmdale, Calif. 93550

Filed Aug. 3, 1983, Ser. No. 519,957
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—786 **20 Claims**



1. In a tissue stimulation lead of the type having an electrode tip electrically connected to a distal end of an elongated electrical conductor encased in a nonconductive encasing material which is generally inert to body fluids, an improved electrode tip comprising:

a body formed of an electrically-conductive material;

a plurality of electrically-conductive fibers, each having a length less than said body, aligned so that the longitudinal axis of each fiber is substantially coplanar with the longitudinal axis of the other fibers, said fibers being sufficiently compressed to form a fiber compress in which said fibers form at least 85 percent of the volume of said fiber compress;

first means for electrically connecting and attaching said body to the distal end of elongated electrical conductor; and

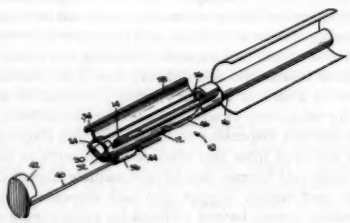
second means for electrically connecting and attaching said fiber compress to said body, an end of said fiber compress comprising an exposed portion of the improved electrode tip, said exposed portion providing a surface area of the electrode tip that enhances sensing electrical signals within the tissue into which the electrode tip is inserted, said exposed portion also providing a porous structure to enhance passive fixation of the tissue to the electrode tip.

4,534,367

ROLL-YOUR-OWN CIGARETTE MAKER

Reginald W. Newsome, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed May 19, 1983, Ser. No. 496,353
Int. Cl.³ A24C *5/00*; A24F *47/00*
U.S. Cl. 131—75 **19 Claims**



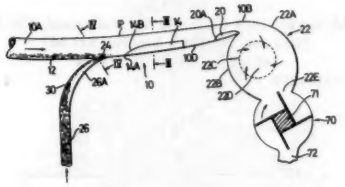
1. A pocket-sized roll-your-own cigarette maker comprising a body portion having two open ends and having a surface which has a third opening substantially larger than said open ends, first and second flaps hinged to said body portion for closing said third opening, a longitudinal flange disposed at one of said open ends for receiving a cigarette tube to be filled with tobacco, and a mandrel slidably received in the other of said open ends, said mandrel being slidable to an extended position to expose its surface for use to wrap a cigarette paper into a tube and being slidable from said extended position along the full length of said body portion to move the entire contents of said body portion through said one open end and into a paper tube received on said longitudinal flange; said longitudinal flange and said mandrel having equal outer diameters.

4,534,368

CIGARETTE MANUFACTURE

Francis A. Labbe, Paris, France, assignor to Mlins PLC, London, England

PCT NO PCT/GB 82/00115, § 371 Date Dec. 15, 1982, § 102(e) Date Dec. 15, 1982, PCT Pub. No. WO 82/03535, PCT Pub. Date Oct. 28, 1982
This PCT application filed Dec. 15, 1982, Ser. No. 453,900
Claims priority, application United Kingdom, Apr. 16, 1981, 8112090
Int. Cl.³ A24C *1/02, 5/39*
U.S. Cl. 131—110 **12 Claims**



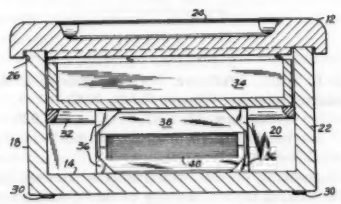
1. Apparatus for feeding tobacco pneumatically into a cigarette making machine comprising a duct defined on one side by a wall which increases in width along the length of the duct from an inlet end to an outlet end, is concave in longitudinal section so that centrifugal force on the tobacco will urge the tobacco against that wall of the duct, and carries means in the form of a splitter member for splitting the tobacco stream flowing along the said wall into two separate streams passing along opposite sides of the splitter member, and to spread apart the two streams.

4,534,369

SMOKERS EQUIPMENT

Garry W. Jenkins, Cleveland, Ohio

Continuation-in-part of Ser. No. 517,804, Jul. 27, 1983, abandoned. This application Aug. 16, 1984, Ser. No. 641,212
Int. Cl.³ A24F *17/00, 19/02*
U.S. Cl. 131—235.1 **4 Claims**



1. Smoker's equipment comprising a base formed from an open top box-like receptacle, a cover adapted to enclose the open top of said base, said cover and base forming a tobacco humidor, said cover further having a dished upper surface to

serve as an ash tray, said base member comprising a bottom wall and side walls extending upwardly therefrom, an article supporting tray, a ledge member located within and secured to said base so as to support said article supporting tray within said base and separate said base into a first upper compartment containing said article supporting tray and a second lower compartment located beneath said article supporting tray, said ledge member has first and second ends and extends almost completely around the internal perimeter of the side walls, thereby defining a single gap between said ends at one of said side walls, said ledge member being substantially and uniformly spaced from the bottom wall, a cigarette paper package support means upwardly extending from the bottom wall into the gap between the ends of said ledge member, said support means comprising a plurality of tabs at the periphery thereof defining a cigarette paper package retaining means, said tabs formed and arranged so as to engage and hold the corners of a package of cigarette papers, thereby supporting said package of cigarette papers within said base while permitting the dispensing of individual cigarette papers.

4,534,370

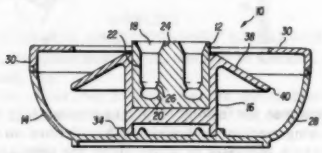
CIGARETTE EXTINGUISHER AND ASH DISPOSAL DEVICE

Robert M. Saxby, 1818 Cleveland St., Hollywood, Fla. 33020

Filed Sep. 30, 1983, Ser. No. 537,447

Int. Cl.³ A24F *19/02, 19/14*

U.S. Cl. 131—237 **4 Claims**



1. A combination cigarette extinguisher and ash disposal device including:

a cigarette extinguishing portion,

a flanged portion having means for mounting said cigarette extinguishing portion therein,

an ash receiving portion having means for mounting said flanged portion,

a cigarette resting and protective lid portion mounted directly on said ash receiving portion spaced from said cigarette extinguishing portion and said flanged portion,

wherein said cigarette extinguishing portion, said flanged portion, said ash receiving portion and said cigarette resting and protecting lid portion are each single piece construction and are removably connected to each other.

4,534,371

SMOKING PRODUCT

Jackie L. White, Pfafftown, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 22, 1983, Ser. No. 525,020

Int. Cl.³ A24B *3/00, 15/18;* A24D *1/18*

U.S. Cl. 131—359 **19 Claims**

1. A smoking product comprising a combustible smoking material coated with a quantity of finely divided vermiculite having a tobacco-like brown color, said finely divided vermiculite having been previously subjected to heat treatment at temperatures of at least 500° C. for a period of time sufficient to develop a brown color in said vermiculite and said quantity of finely divided vermiculite being sufficient to impart a tobacco-like brown color to said smoking material.

4,534,372

SMOKING PRODUCT

Jackie L. White, Pfafftown, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Aug. 22, 1983, Ser. No. 525,056

Int. Cl.³ A24B *15/18, 15/22;* A24D *1/18*

U.S. Cl. 131—359 **16 Claims**

1. A smoking product comprising a combustible smoking material coated with a quantity of finely divided, toasted cereal grain having a tobacco-like brown color, said quantity being sufficient to impart a tobacco-like brown color to said smoking material.

4,534,373

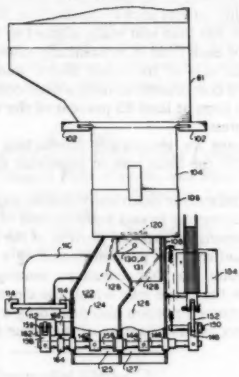
DISPENSING MACHINE WITH REMOVABLE DISPENSING UNIT

John Glinka, Mt. Prospect, and Leonard A. Fish, Chicago, both of Ill., assignors to Casino Technology, Schiller Park, Ill.

Filed Sep. 30, 1982, Ser. No. 428,562

Int. Cl.³ G07D *1/02*

U.S. Cl. 133—5 R **9 Claims**



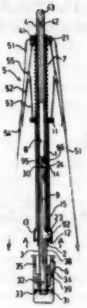
1. A dispensing machine having a bill acceptor for accepting units of currency presented to a currency receiving slot, comprising in combination; a supply hopper for storing a quantity of circular items to be delivered to a delivery tray in response to currency being presented to said slot, housing means for surrounding said bill acceptor and said hopper, said hopper being mounted in fixed position relative to said housing means, a dispensing unit located below said hopper in adjustable position relative to said hopper, said dispensing unit being adapted to dispense tokens into said delivery tray from said hopper in response to a unit of currency being presented to said slot, means for selectively closing the path for tokens between said hopper and said dispensing unit, whereby said dispensing unit may be removed from said housing means without removing tokens from said hopper, and an intermediate hopper disposed between said supply hopper and said dispensing unit, said intermediate hopper having surfaces for supporting a quantity of tokens between said supply hopper and said dispensing unit, and means for selectively lowering one of said supporting surfaces, whereby at least one of said supported tokens in lowered, clearing a space above said supported tokens and below said supply hopper.

4,534,374

FULLY AUTOMATIC SINGLE PUSH BUTTON TYPE UMBRELLA

San-Tong Day, 1 Chung Yang North Rd., Ching Shui, Taiwan Hsien, Taiwan

Filed Feb. 7, 1984, Ser. No. 577,826
Int. Cl.[3] A45B 25/16
U.S. Cl. 135—22 4 Claims



1. A fully automatic single push button type umbrella comprising:

an outer tubular shaft provided with a lower ring fixed to an upper end and pawl engaging openings at a lower end and said upper end thereof;

an intermediate tubular shaft slidably disposed within said outer tubular shaft and provided with an intermediate ring fixed to an upper end pawl engaging openings at a lower end intermediate the ends thereof;

a lower inner shaft slidably inserted in a lower end portion of said intermediate tubular shaft and provided with a grip mounted to a lower end thereof;

an upper inner shaft slidably inserted in the upper end of said intermediate tubular shaft and provided with an upper ring fixed to an upper end thereof;

a plurality of ribs including dome ribs, stretcher ribs and supporting ribs pivotably interconnected to said rings to form an umbrella frame;

first spring means for closing the umbrella provided on said intermediate tubular shaft between said intermediate and lower rings and a second spring means for opening said umbrella provided within said intermediate tubular shaft between said upper and lower inner shafts;

said lower inner shaft provided with an axially elongated slot at the lower end thereof with said slot having an enlarged lower portion and further provided with an upper opening at an upper end;

said lower inner shaft being further provided with a first and second spring pawl means for locking said intermediate tubular shaft and said outer tubular shaft;

said first spring pawl means having an upper end fixedly attached to the upper end wall of said lower inner shaft, a lower end being free from attachment and provided with a projection protrusible through the lower end of said elongated slot, and an intermediate portion provided with a locking head protrusible through an upper portion of said elongated slot;

a push button member engageable with said projection;

wherein, when the umbrella is in the closed position, said locking head of the first spring pawl means is engaged in the opening of the lower end of said intermediate tubular shaft and the pawl engaging means on the lower end of said outer tubular shaft;

said second spring pawl means is engaged in the upper opening of the intermediate tubular shaft and the upper opening of the outer tubular shaft;

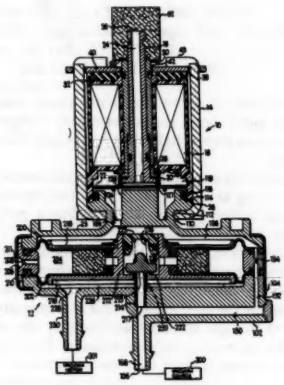
and wherein, when the umbrella is in the open position, said locking head is engaged only in the lower opening of said intermediate tubular shaft and the second spring pawl means is engaged in the upper opening of said intermediate tubular shaft and the lower opening of said outer tubular shaft.

4,534,375

PROPORTIONAL SOLENOID VALVE

Clarence D. Fox, Decatur, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 349,488, Feb. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 311,820, Oct. 16, 1981, abandoned. This application Aug. 29, 1984, Ser. No. 645,191
Int. Cl.[3] F16K 31/06; F15C 3/00
U.S. Cl. 137—82 22 Claims



1. An electromagnetic valve assembly comprising an outer member of a magnetic material, having a top and a bottom;

a top member of a magnetic material, affixed near the top of the outer member;

a center member of magnetic material extending through said top member and positioned generally within the outer member, which center member has a bore with an inlet port for receiving fluid, and an exit port;

a non-magnetic seat positioned about the exit port and extending beyond the center member,

a base member, attached to the bottom of the outer member to define a chamber adjacent the non-magnetic seat;

a magnetic closure member, positioned within the chamber, which closure member is a flat disc armature and, with the outer member, the top member and the center member, completes a flux path including an air gap defined between the magnetic closure member and said exit port end of the center member;

a reference member of cylindrical shape positioned about the center member; and

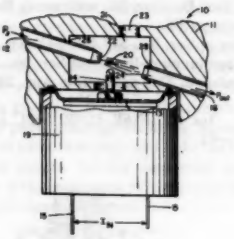
means for establishing the flow of electromagnetic flux through said flux path, which means includes an electrical winding, and a bobbin substantially encircling said reference member and substantially enclosing the electrical winding, the relative positions of the center member and the closure member being adjustable to place the exit port of the center member nearer to or farther from the closure member and thus regulate the air gap distance, so that for a given level of flux in the flux path, the closure member will be urged against the non-magnetic seat as a function of the air gap distance and pressure differential between said chamber and said bore.

4,534,376

ELECTRIC SIGNAL TO PRESSURE SIGNAL TRANSDUCER

Gregory C. Brown, Chaska, Minn., assignor to Rosemount, Inc., Eden Prairie, Minn.

Filed Sep. 1, 1983, Ser. No. 528,727
Int. Cl.³ G05D *16/00*
U.S. Cl. 137—83 **21 Claims**



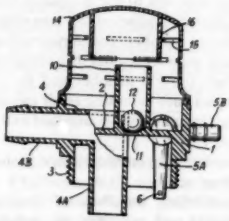
1. An electric signal to pneumatic signal transducer having an electric input signal and a gas supply comprising:
nozzle means connected to the gas supply for expelling a gas stream,
receiver means spaced from the nozzle means positioned for recovering at least a portion of the expelled gas stream, the recovered portion constituting a pneumatic output signal; and
deflector means, the position of which relative to the gas stream is controlled by the electric input signal for aerodynamically deflecting the gas stream expelled from the nozzle means to thereby affect the magnitude of the potion of the gas stream recovered by the receiver means and for providing an aerodynamic force to urge the deflector means further into the gas stream.

4,534,377

DEVICE FOR DECANTING A LIQUID FROM A RECIPIENT

Guy Ducros, St. Germain-les-Corbeil, France, assignor to Technique et Esthetique pour l'Industrie et la Distribution, Brunoy, France

Filed Oct. 18, 1983, Ser. No. 543,162
Claims priority, application France, Nov. 5, 1982, 82 18603
Int. Cl.³ B65D *47/00*; B67D *5/34*
U.S. Cl. 137—212 **6 Claims**



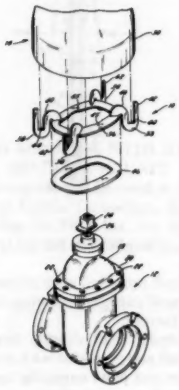
1. A decanting device including a body provided with a skirt for assembly on a receptacle, comprising:
a partition including an inner transverse wall,
a first elbow-shaped conduit for decanting liquid from the receptacle and a second elbow-shaped conduit for injecting gas into the receptacle, said first conduit and said second conduit traversing said inner transverse wall,
a cap connected to said body and having an inner extension,
a safety valve associated with said inner transverse wall comprising a tubular member extending away from the side of said transverse wall opposite said skirt towards said inner extension of said cap.

4,534,378

GATE VALVE ADAPTOR

Michael S. Gagas, Milwaukee, and Stanley J. Gagas, Oak Creek, both of Wis., assignors to Adaptor, Inc., Milwaukee, Wis.

Filed May 16, 1983, Ser. No. 495,148
Int. Cl.³ F16L *5/00*
U.S. Cl. 137—367 **5 Claims**



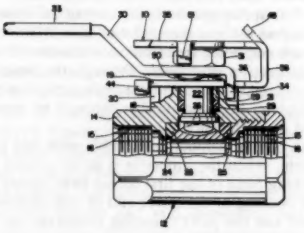
1. A gate valve-key box adaptor comprising a
flat rectangular ring having a configuration corresponding to the configuration of the bonnet flange of a gate valve, said ring being adapted to be placed on the flange, and a plurality of S-shaped arms extending radially outwardly from said ring and mounted on the corners of the ring, a key box including a botton edge for engaging a portion of each one of said S-shaped arms for supporting said key box on said gate valve bonnet flange.

4,534,379

LOCKING FRAME FOR VALVES

Donald G. Burge, Plainwell, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Apr. 5, 1984, Ser. No. 596,977
Int. Cl.³ F16K *35/00*
U.S. Cl. 137—385 **3 Claims**



1. A fluid valve with a handle locking device, comprising:
a body having a bore therein for flow of fluid,
an upstanding boss on said body,
a shaft journaled in said boss, said shaft being operatively

coupled to a valve disposed in said body for controlling the flow of fluid through said bore,

a handle keyed on said shaft for rotating said shaft between valve open and valve closed positions, said handle being elongated having a depending tang at one end and a grasping portion at the other end,

a nut securing said handle to said shaft,

a spring disposed around said shaft urging said handle against said nut,

a first stop flange on said body for limiting rotatable movement of said shaft at a valve open position,

a second stop flange on said body for limiting rotatable movement of said shaft at a valve closed position,

said tang on said handle being disposed between said flanges and rotatable with said handle into engagement with said stop flanges, and

a U-shaped frame fixed to said body and extending to a single location adjacent said handle and between the valve open and valve closed positions of said handle, said frame comprising substantially parallel upper and lower plates and having an interconnecting bend portion, said nut positioned between said upper and lower plates, said lower plate having an aperture receiving said shaft and being supported on said body boss between said boss and said spring, first and second depending tabs on said lower plate adapted to engage respectively said first and second stop flanges to prevent rotation of said frame, each said upper and lower plate having a hole therein at said single location, said holes being in alignment and adapted for receipt of a device at said single location for selectively preventing rotation of said handle from the valve open and valve closed positions.

4,534,380

GAS REGULATOR VALVE

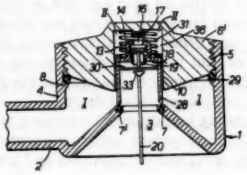
Nils T. Ottestad, Langerekkja 73, 5260 Indre Arna, Norway

Filed Feb. 18, 1983, Ser. No. 467,844

Claims priority, application Norway, Mar. 16, 1982, 820848

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—490 **5 Claims**



1. A balanced gas regulator valve comprising a housing (1) having an inlet (2) and an outlet (3), partition means (6',9) dividing said housing (1) in a first (I) and a second (II) chamber, said inlet and outlet communicating with said first chamber,

a main valve comprising said outlet defining an annular valve seat (7), valve guide means (32,36) mounted in said housing with respect to said valve seat and a cylindrical valve body (28;34) displaceably mounted relative to a guide means (36;32) in said housing (1) to move toward and away from said valve seat and having a sealing end edge at one end thereof cooperating with said valve seat (7),

a pressure equalizing passage (10) between the two chambers (I, II),

means for relaying the pressure in said second chamber to said cylindrical valve body to urge said valve body against said valve seat,

a channel (19) extending between said second chamber (II) and said outlet (3),

a control valve (13, 16) located in said channel (19) for opening and closing the channel to relieve pressure in said second chamber, and

operating means (20) extending through said outlet (3) and being operatively connected to said control valve (13, 16) to effect opening and closing thereof,

said cylindrical valve body (28;34) having a constant diameter which is substantially equal to the diameter of said annular valve seat (7), and

said operating means (20) being arranged to be mechanically connected to and to move said cylindrical valve body away from said main valve seat (7) only after having opened said control valve (13, 16).

4,534,381

ELECTROMAGNETIC VALVE

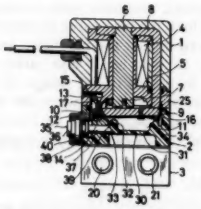
Kazuhiro Hozumi, and Shigeo Tamaki, both of Asahi, Japan, assignors to Kuroda Seiko Company Limited, Kanagawa, Japan

Filed Dec. 16, 1983, Ser. No. 562,417

Claims priority, application Japan, Dec. 30, 1982, 57-197987[U]; Dec. 30, 1982, 57-197988[U]

Int. Cl.³ F16K *31/06, 11/02*

U.S. Cl. 137—625.65 **8 Claims**



1. An electromagnetic valve comprising:

an electromagnetic unit having a magnetic core, a coil bobbin arranged around the core, an electromagnetic coil would around the coil bobbin, a stationary yoke having one end connected to one end of the core, a first valve seat formed in a flange of the coil bobbin and a first fluid passage communicated with the first valve seat, said stationary yoke and flange of said coil bobbin being aligned in a flat plane with saaid core; and

a valve unit including a movable yoke arranged within a valve chamber and having one end rotatably coupled with the other end of the stationary yoke, a valve stopper provided in the other end of the movable yoke at a position opposed of the first valve seat, a second valve seat provided opposite to the valve stopper, a second fluid passage communicated with the second valve seat, a third fluid passage comunicated with the valve chamber and a resilient member for urging the valve stopper against the second valve seat to communicate the first fluid passage with the valve member, when the electromagnetic coil is de-energized; whereby when the electromagnetic coil is energized, the movable yoke is attracted to the core and the valve stopper is urged against the first valve seat to communicate the second fluid passage with the valve chamber.

4,534,382

THREE-WAY SOLENOID VALVE

Christian Tanguy, Frepillon, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Mar. 12, 1984, Ser. No. 588,175

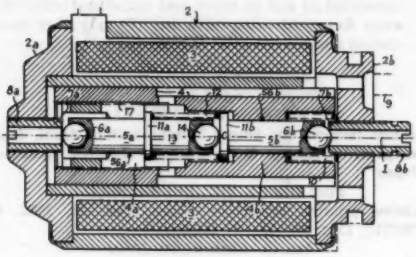
Claims priority, application France, Mar. 21, 1983, 83 04581

Int. Cl.³ F15B *13/044*

U.S. Cl. 137—627.5 **11 Claims**

1. A three-way solenoid valve with three positions, having a

general construction with symmetry of revolution about an axis and incorporating a magnetic armature which is movable in translation along the axis under the action of an electromagnetic coil and a return spring, the armature being hollow and incorporating internally two valve members each having an inner end and situated on the axis, the two valve members movable relative to one another and relative to the armature, separated from one another by a spring and provided with



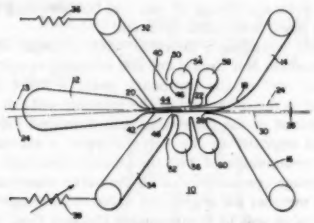
flanges through which the two valve members can be displaced by the magnetic armature with respect to respective facing fixed seats which the two valve members are capable of closing, characterized in that the magnetic armature operates each valve member so as to apply one valve member against the respective seat by means of the flange of the other valve member and a spacer positioned between the inner ends of the valve members, the spacer moving to bearing engagement against the inner end of one of the valve members.

4,534,383

FLUIDIC SET POINT PRESSURE SENSOR

R. Michael Phillippi, Highland, and Thadeusz M. Drzewiecki, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 31, 1983, Ser. No. 547,166
Int. Cl.³ F15C *1/08*
U.S. Cl. 137—840 **10 Claims**



1. A fluidic set point pressure sensor for converting the absolute pressure of a pressurized fluid to a differential pressure indicating the pressure of the pressurized fluid relative to a predetermined set point pressure, comprising:

input means, connected to receive said pressurized fluid, for directing a jet of fluid along a first centerline at a velocity determined by said absolute pressure;

output means, disposed downstream from said input means, including first and second outlets separated by a splitter which is disposed asymmetrical to said first centerline such that at least a greater portion of said jet directed along said first centerline is received at the first outlet; and

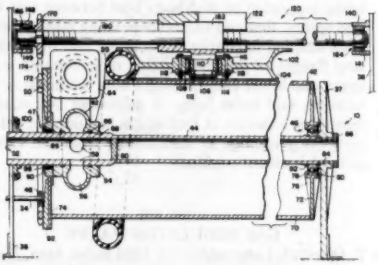
control means for deflecting said jet towards said second outlet in accordance with said jet velocity such that as the jet velocity increases from zero, the deflection of the jet increases to a maximum value, then decreases, so that the differential pressure generated by the jet between the first and second outlets increases to a maximum positive value at which the pressure at the second outlet is greater than the pressure at the first outlet, then decreases to a negative value at which the pressure at the first outlet is greater than the pressure at the second outlet, the differential pressure being equal to zero when said absolute pressure is equal to said predetermined set point pressure, the differential pressure becoming positive whenever said absolute pressure falls below said set point pressure and becoming negative whenever said absolute pressure rises above said set point pressure.

4,534,384

REEL SYSTEM FOR AXIALLY EXTENDING HOSE

Frank C. Graham, Sykesville, and James T. Parker, II, Woodbine, both of Md., assignors to Flight Refueling, Inc., Columbia, Md.

Filed Dec. 15, 1982, Ser. No. 449,863
Int. Cl.³ B64D *37/00*
U.S. Cl. 137—899.2 **1 Claim**



1. A system for in-flight refueling of aircraft, comprising:

an elongated refueling pod;

means for connecting said pod to an aircraft;

a supply hose having an inlet end and an outlet end;

a drum mounted for rotation in said pod about a central axis such that said drum axis extends along the longitudinal direction of said pod, said drum having a substantially smooth surface for receiving said supply hose, said inlet end being connected to said drum;

means for rotating said drum for wrapping said supply hose around said outer surface, said rotating means being positioned at an axial end of said drum and contained within said pod;

feed means connected for operation in synchronism with said rotating means for feeding said supply hose axially of said drum toward or away from said drum in accordance with the direction of rotation of said drum, and causing only a single wrap of said supply hose to be positioned on said drum, said feed means including a sheave having an axis of rotation perpendicular to the axis of said drum, said hose being wrapped around a portion of said sheave such that said sheave changes the direction of said hose from transverse of said drum to axially of said drum;

means for supporting said sheave and moving said sheave axis axially of said drum in response to rotation of said drum, said supporting and moving means comprising a carriage having bearing means rotatably mounting said sheave such that said sheave axis is perpendicular to said drum axis; screw threads formed in said carriage; a threaded shaft extending axially of said drum and received in said screw threads for moving carriage and said sheave axially of said drum, means for rotating said threaded shaft in synchronism with said drum; and, a pair of support members positioned on opposite sides of said threaded shaft, said support members slideably engaging said car-

riage and extending axially of said drum for inhibiting twisting of said carriage as it moves along said drum; and

a hose guide member mounted to support said hose in substantially the same plane as said sheave as said hose comes off said sheave.

4,534,385

LEVELING DEVICE FOR WEAVING MECHANISMS INCORPORATING CAMS OF THE NEGATIVE TYPE

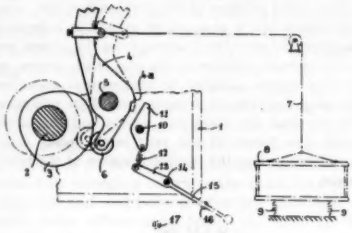
Jean-Paul Froment, La Creuse Sud - Doussard, FR 74210 Faverges, and Louis P. Houlon, Duingi, FR-74410 Saint Jorioz, both of France

Filed Sep. 23, 1983, Ser. No. 535,091

Claims priority, application France, Oct. 20, 1982, 82 17843

Int. Cl.³ D03C *5/00, 1/00, 13/00*

U.S. Cl. 139—79 **2 Claims**



1. In a weaving loom of the negative cam type having multiple oscillating levers each connected to a heddle frame, and the weaving loom having multiple cams each operative to displace an oscillating lever to raise an associated heddle frame which is yieldably returned toward lowered position, a leveling device comprising:

a stop on each oscillating lever;

a pawl pivotally supported opposite each lever stop, each pawl being pivotable between an unlocked position out of contact with its associated lever and a locked position in which it engages the lever and locks the stop when the lever is displaced by a cam;

a control member selectively operable between first and second control positions; and

separate yieldable means for each pawl, each yieldable means being connected between its pawl and the control member, said yieldable means all being operative when the control member is in its first position to urge their associated pawls into their unlocked positions and being operative when said control member is in its second position to urge the associated pawls against their oscillating levers, whereby as the levers are displaced by the cams to raise the heddles the pawls will engage the stops of the engaged levers and lock the levers to hold the heddle frames in their raised positions.

4,534,386

TENSIONING BEAM ASSEMBLY FOR A WEAVING MACHINE

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 13, 1983, Ser. No. 531,703

Claims priority, application European Pat. Off., Oct. 26, 1982, 82810448.9

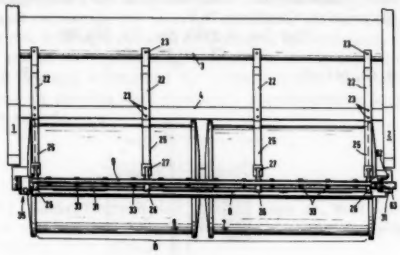
Int. Cl.³ D03D *49/22*

U.S. Cl. 139—114 **12 Claims**

1. In a weaving machine having a frame of predetermined weaving width, the combination of

a rotatable support beam mounted across said weaving width of said frame on a longitudinal axis;

a spring biased tensioning element mounted on said beam for pivoting said axis under the bais of warp threads within said weaving width; and



means rotatably supporting said beam intermediately of said weaving width of said frame.

4,534,387

METHOD AND APPARATUS FOR INSERTING DIFFERENT WEFT THREADS HAVING DIFFERENT PROPERTIES INTO THE WARP SHED OF A JET WEAVING MACHINE

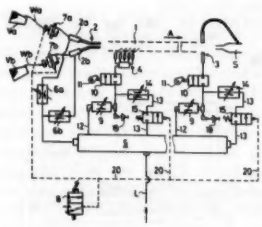
Cornelius A. J. H. van Hest, Helmond, Netherlands, assignor to Ruti-te Strake B.V., Netherlands

Filed Aug. 17, 1982, Ser. No. 408,808

Claims priority, application Netherlands, Jan. 18, 1982, 8200169

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **13 Claims**



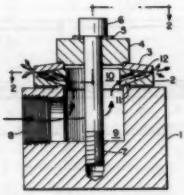
1. A method of inserting different weft threads having different yarn properties into a warp shed of an air jet weaving machine according to a predetermined insertion sequence, comprising the steps of feeding different weft threads from corresponding spools to a first jet arrangement supplied with a flowing fluid, inserting the weft threads into the warp shed through said first jet arrangement and a second jet arrangement downstream of the first jet arrangement in the weft insertion direction, supplying said second jet arrangement with a flowing fluid, operating the second jet arrangement concurrently with the first jet arrangement, changing the fluid supply pressure for at least a portion of the second jet arrangement independently of the fluid supply pressure of the first jet arrangement for different types of weft thread synchronously with the insertion sequence for the different weft thread.

4,534,388

DISPERSION SYSTEM AND METHOD

David B. Pall, Roslyn Estates; Peter J. Degen, Huntington, and John Mischenko, III, Amityville, all of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Jun. 7, 1983, Ser. No. 501,889
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—1 **36 Claims**



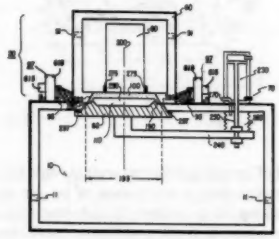
15. A method for dispersing aggregates in an aggregate-containing fluid medium employing a self-cleaning system for dispersing aggregrates ina fluid medium which system includes first and second members operatively associated to form an internal chamber and having an inlet to said chamber for admitting said fluid, and with at least one of said members resiliently biased toward the other, said method comprising the steps: (a) introducing said fluid medium into said chamber through said inlet under a pressure in the range of from about 50 to about 1,000 psid, the pressurized fluid deforming said at least one of said members to provide an elongated orifice between said first and second members for egress of fluid medium from said system, said elongated orifice under said pressure haivng a minimum length of about 3 inches, a transverse dimension or width in the range of from about 1 to about 1,500 micrometers and a ratio of its length to its transverse dimension or width of about 100:1 or greater and (b) passing said fluid medium through said elongated orifice, thereby dispersing said aggregate in said fluid medium.

4,534,389

INTERLOCKING DOOR LATCH FOR DOCKABLE INTERFACE FOR INTEGRATED CIRCUIT PROCESSING

Barclay J. Tullis, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 29, 1984, Ser. No. 594,498
Int. Cl.³ B65B *1/00*
U.S. Cl. 141—98 **8 Claims**



1. An interface between first and second containers comprising:

alignment means for orienting the first container in a fixed position relative to the second container;

a first door for independently sealing the first container;

a second door for independently sealing the second container;

said first and second doors each having a mating outer surface of substantially equal exterior dimensions, so that substantially all contamination which has accumulated on the exterior surface of the doors when the containers are separated will be trapped between said doors when the containers are positioned together with said alignment means;

elevator means coupled to said doors for transporting said doors while coupled together at their mating outer surfaces into said containers as a single unit; and

interlock means coupled to the first and second doors for inhibiting the opening of the first door except when the first and second containers are mated in the alignment means, said interlock means having

port latch means coupled to the first container for maintaining the first door in a closed position when the port latch means is in a closed position and for permitting the first door to open when the port latch means is in an opened position,

door pull means coupled to the first container for transporting the port latch means from the opened position to the closed position of the port latch means, said door pull means being adapted so as not to independently transport the port latch means from the closed position to the opened position of the port latch means, and

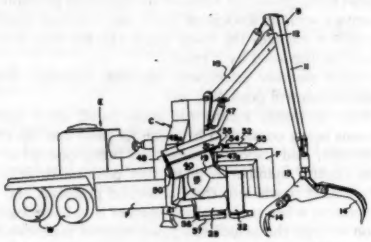
latch foot means coupled to the second container for engaging the port latch means and door pull means so that together the door pull means and the latch foot means can transport the port latch means from the closed position to the opened position of the port latch means.

4,534,390

PORTABLE CHIPPER WITH RELATIVELY LOW POWER HIGH TORQUE TREE FEED MECHANISM FOR FEEDING THE TREE OR OTHER PRODUCT TO BE CHIPPED AT A CONTROLLED FEED ANGLE

Norval K. Morey, Winn, and Ivor Bateman, Mt. Pleasant, both of Mich., assignors to Morbark Industries, Inc., Winn, Mich.

Filed Nov. 9, 1983, Ser. No. 549,801
Int. Cl.³ B27L *11/00*
U.S. Cl. 144—373 **18 Claims**



1. In a feeding and chipping assembly for longitudinally feeding whole trees with attached limbs and branches butt-first, and like chippable material to be reduced to chips, and including: a longitudinally extending portable chipper frame; a chipper disc thereon; a disc housing for the disc fixed on the frame and having a forwardly facing wall surface with an opening therein to admit the material to the disc; generally radially extending knife means mounted on the front face of said chipper disc; means for rotating said disc at chipping speeds; a chute surface leading rearwardly to the opening in said disc housing; an anvil mounting plate, cooperable with said knife means, at one side of said opening; a generally vertically disposed, fixed axis, side feed roll disposed a spaced distance forwardly of the anvil and defining with the anvil one side of a pathway of feed; a swing side feed roll defining the opposite side of said pathway; a bottom feed roll disposed crosswisely to said pathway defining the lower boundary of the pathway; said swing side feed roll being swingable generally about a generally horizontal axis extending generally

parallel to said pathway; each of said side feed rolls being rotatable about axes which are disposed in substantially the same transverse plane; and means supported by the frame for driving said feed rolls at coordinated speeds of rotation in a direction to feed material into the opening and on to be chipped by said knife means.

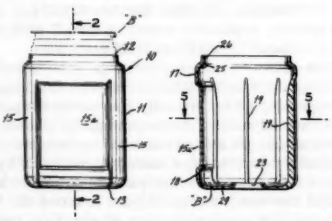
17. Apparatus for longitudinally feeding whole trees with attached limbs and branches butt-first, and reducing the tree to chips, including: a frame, a chipper disc journaled thereon; a disc housing on the frame with a forwardly facing wall surface, the wall surface having an opening therein to admit the trees to the disc, the disc having generally radially extending knife means mounted on its front face; a chute surface converging rearwardly to the opening in said disc housing; an anvil mounting plate, cooperable with the knife means to chip, fixed at and bordering one side of said opening; a generally vertically disposed, fixed axis, side feed roll disposed spaced distance forwardly of the anvil and defining with the anvil one side of a pathway of feed which extends at an acute angle to the opening and disc; a movable side feed roll defining the opposite side of the pathway; a generally horizontal axis bottom feed roll disposed crosswisely to the pathway having an upper surface defining the lower boundary of the pathway; the movable side feed roll being movable in a transverse plane; said forwardly facing wall surface around said opening having marginal top and bottom edges connected by opposite side edges, the bottom edge being at a level generally at the elevation of the upper surface of the bottom feed roll; said chute surface having a bottom wall extending to bridge the space between the bottom feed roll and said bottom edge and extending generally upwardly from substantially below the level of the upper surface of said bottom feed roll to the bottom edge of said opening, the chute surface also having a transversely outwardly and upwardly, extending curved side wall extending generally from the bottom wall to said anvil mounting plate, and converging in a rearward direction to said opening from behind said fixed axis side feed roll; means for driving the disc at a tree chipping speed; and means for driving the feed rolls at coordinated speeds of rotation in a direction to feed the tree into the opening and on to be chipped by said knife means while said fixed axis side roll and bottom roll essentially block off said bottom and side walls of said chute surface such as to substantially avoid frictional sliding contact of the tree butt with the chute surface.

4,534,391

BEVERAGE INSULATOR WITH ADVERTISING PANEL

Joseph J. Ventimiglia, St. Louis, and Lawrence R. Diener, Fenton, both of Mo., assignors to Sinclair & Rush, Inc., St. Louis, Mo.

Filed Dec. 12, 1983, Ser. No. 560,733
Int. Cl.[3] B65D *23/08*; G09F *3/00*
U.S. Cl. 150—52 R **1 Claim**



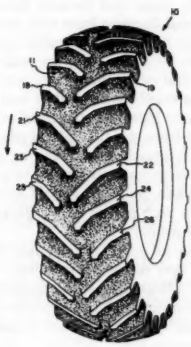
1. A hand held beverage receptacle insulator formed from a unitary polymeric material comprising a cylindrical side wall defined by longitudinal panels, several of which are contiguous, of equal width and have the same outside diameter, and the last of which is wider than the others and is recessed to accommodate imprinting and the like, parallel shoulders of the same plane as the side wall circumference protecting the top and bottom edges of the said last panel, the panels being formed by longitudinal grooves, and the inside of the side wall having inwardly extending ribs aligned with the grooves and extending toward the centerline of the holder to strengthen the side wall and engage the beverage receptacle, the inner edges of the ribs defining a cylindrical opening of approximately the same size as the top opening, a bottom wall formed with a central opening surrounded by a raised internal lip, and a reduced top opening sized to snuggly accommodate a beverage receptacle.

4,534,392

TRACTOR TIRE

Mark L. Bonko, Hartville, and Loran C. Lopp, Jr., Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 16, 1984, Ser. No. 610,914
Int. Cl.[3] B60C *11/00*
U.S. Cl. 152—209 B **11 Claims**



1. A pneumatic tire for tractors and like vehicles wherein said tire has a mid-circumferential centerplane and a tread portion with first and second lateral edges, said tread portion comprising:

(a) two sets of primary lugs, each lug of said first set of primary lugs having first and second portions, said first portion beginning at the first lateral edge of the tread and extending to an axially inner end located between 40 and 60 percent of the axial distance from said first lateral edge of the tread to said mid-circumferential centerplane of the tire at an angle of between 59 and 69 degrees with respect to said mid-circumferential centerplane, said second portion extending from the axially inner end of said first portion to an axially inner end located between 96 and 112 percent of the axial distance from said first lateral edge of the tread to said mid-circumferential centerplane at an angle of between 38 and 50 degrees with respect to said mid-circumferential centerplane;

(i) each lug of a second set of primary lugs being similar to the lugs of said first set of primary lugs but opposite in hand, having a beginning at the second lateral edge of the tread and being offset circumferentially of said tire with respect to the next adjacent pair of primary lugs in said first set of primary lugs so that the leading edge of each said primary lug is spaced a distance of between 40 and 60 percent of the tread width from the lagging edge of a lug of said other set of primary lugs as measured on said mid-circumferential centerplane;

(b) two sets of secondary lugs, each lug of a first set of secondary lugs having first and second portions, said first portion beginning at said first lateral edge of the tread and extending to an axially inner end located between 62 and

82 percent of the axial distance from said first lateral edge of the tread to said mid-circumferential centerplane at an angle of between 59 and 69 degrees with respect to said mid-circumferential centerplane, said second portion extending from the axially inner end of said first portion to an axially inner end located between 96 and 112 percent of the axial distance from said first lateral edge of the tread to said mid-circumferential centerplane at an angle of between 38 and 50 degrees with respect to said mid-circumferential centerplane, and only one of said secondary lugs being disposed between each pair of next adjacent primary lugs of the first set of primary lugs;

(i) each lug of a second set of secondary lugs being similar to the lugs of said first set of secondary lugs but opposite in hand and having a beginning at the second lateral edge of the tread, only one of said secondary lugs being disposed between each pair of next adjacent primary lugs of the second set of primary lugs; and

(c) two sets of tertiary lugs, each lug of a first set of tertiary lugs having first and second portions, said first portion beginning at said first lateral edge of the tread and extending to an axially inner end located between 24 and 44 percent of the axial distance from said first lateral edge of the tread to said mid-circumferential centerplane at an angle of between 59 and 69 degrees with respect to said mid-circumferential centerplane, said second portion extending from the axially inner end of said first portion to an axially inner end located between 63 and 83 percent of the axial distance from said first lateral edge of the tread to said mid-circumferential centerplane at an angle of between 38 and 50 degrees with respect to said mid-circumferential centerplane, only one of said tertiary lugs being disposed between each pair of next adjacent primary lugs of the first set of primary lugs;

(i) each lug of a second set of tertiary lugs being similar to the lugs of said first set of tertiary lugs but opposite in hand and having a beginning at the second lateral edge of the tread, only one of said tertiary lugs being disposed between each pair of next adjacent primary lugs of the second set of primary lugs.

4,534,393

PNEUMATIC TIRE

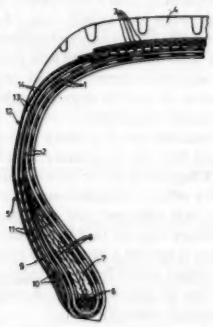
Jakob Ippen, Leverkusen, and Friedel Stüttgen, Pulheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 404,436, Aug. 2, 1982, abandoned. This application Jun. 7, 1984, Ser. No. 617,963

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131515

Int. Cl.³ B60C *13/00, 15/06*

U.S. Cl. 152—524 **3 Claims**



1. In a pneumatic tire having a continuous carcass folded around cores in the beads of the tire and extending into the side walls of the tire, two at least double encircling layers on the exterior of the carcass in each side wall of the tire, and each at least double encircling layer consisting of at least two laminated rubber and/or reinforcing plies, the improvement according to which each rubber and/or reinforcing ply of one at least double encircling layer abuts in the tire side walls one of the plies of the other at least double encircling layer, and each abutment being staggered with respect to an adjacent abutment whereby the plies of the two at least double encircling layers are laterally interlaced with one another in the side walls of the tire.

4,534,394

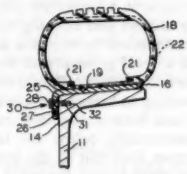
WHEEL ASSEMBLY HAVING SELF-CONTAINED TIRE MOUNTING CAPABILITY

Charles E. Grawey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 13, 1983, Ser. No. 494,200

Int. Cl.³ B60B *21/10, 21/12;* **B60C** *7/24*

U.S. Cl. 152—396 **4 Claims**



1. A wheel assembly (**10**) comprising:

a wheel rim (**11**) having a tire receiving surface (**12**) and a plurality of axially extending slots (**13**) recessed into the tire receiving surface (**12**), said tire receiving surface being defined solely by a single frusto-conical surface;

a closed torus tire (**18**) mounted on the wheel rim (**11**) and having an inner rim surface (**19**) defined solely by a single frusto-conical surface, said inner rim surface being mated with the tire receiving surface (**12**) of the wheel rim (**11**);

a plurality of retainers (**25**) extending into the slots (**13**) and adapted to provide a driving connection between the tire (**18**) and wheel rim (**11**); and

means (**30**) for driving each of the retainers (**25**) into the slots (**13**) for establishing said driving connection between the tire and rim.

4,534,395

FOLDING DOOR

William F. Carroll, Pasadena, Calif., assignor to Section Pty. Ltd., Dandenong, Australia

Filed Sep. 30, 1982, Ser. No. 429,634

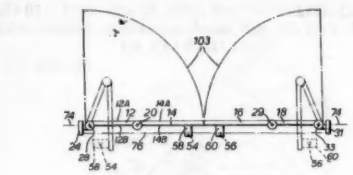
Claims priority, application Australia, Oct. 1, 1981, PF1024

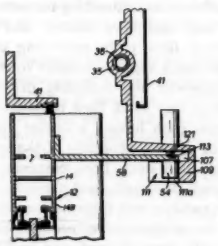
Int. Cl.³ E06B *3/48;* **E05D** *15/26*

U.S. Cl. 160—199 **7 Claims**

1. A folding door having a first panel with first hinge means at a first edge adapted for pivotally connecting the panel to an upright surface adjacent a door opening, for pivoting of the panel about an upright axis adjacent the surface, and a second panel pivotably connected at a second edge thereof by second hinge means at an edge of the first panel opposite the first edge thereof, and movement means adapted to move the first and second panels from a closed position at which the two panels are substantially in a common plane to an open position at which the first panel is pivoted away from a location adopted in the closed position and the second panel is folded back upon the first panel, the movement means comprising a movable member mounted for movement generally parallel to the common plane of the panels and having coupling means coupling the movable member to the second panel; the coupling means pivotally interconnecting the movable member to the second

panel such that the second panel is pivotal relative to the movable member about a pivot axis which is substantially fixed relative to the movable member and which pivot axis is substantially parallel to the upright axis and moves during opening and closing of the door in a plane parallel to the common





plane, the coupling between the movable member and the second panel being releasable under pressure applied normal to the plane of the second panel to permit pivotal movement of the first and second panels to an open position without folding of the panels occuring.

4,534,396

ROLLER SHADE RETURN MECHANISM

Stig Jung, Knivgatan 12, Malmö , Sweden

PCT No. PCT/SE82/00361, § 371 Date Jul. 21, 1983, § 102(e) Date Jul. 21, 1983, PCT Pub. No. WO83/01809, PCT Pub. Date May 26, 1983

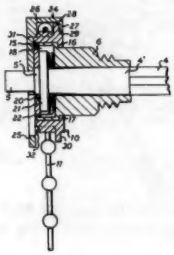
PCT Filed Nov. 2, 1982, Ser. No. 522,361

Claims priority, application Sweden, Nov. 23, 1981, 8106945

Int. Cl.[3] E06B *9/208*

U.S. Cl. 160—298 **3 Claims**

1. A roller shade return mechanism comprising a rotary roller shade rod, a drive for rotating the shade roll and a friction brake which comprises a plurality of washers and which acts between rotating and non-rotating members of the shade return machanism for holding the roller shade rod in selected positions of the shade, said roller shade rod having a recess in at least one end thereof and being rotatably mounted in relation to said non-rotary members, said non-rotary member comprising a non rotary spindle (**4**) mounted in said rod and supporting at one end thereof a non-rotary profiled pin (**5**) to be received in and supported by a roller shade mounting bracket, said rod being rotatable by a drive which comprises a sprocket (**10**) mounted on said rotatable member (**6**), the latter being arranged for connection with the roller shade rod, said sprocket being conformed to cooperate with a chain (**11**), wherein said rotatable member (**6**) is in the shape of an end plug adapted to be fixedly mounted in said recess at the end of the rod (**1**), said end plug having a throughbore to constitute a bearing to be rotatably mounted on said nonrotary spindle (**4**) at its outer end portion thereof adjacent said pin (**5**), said through-bore having, at its axially outer end, an enlargement forming a chamber (**18**), said chamber including, and being defined by, a peripheral wall and an axially inner bottom wall housing said friction brake, wherein said washers of said friction brake comprise a backing washer (**21**) non-rotatably supported by said non-rotary spin-



dle (**4**) and at least two convex friction washers (**22**), each having a central aperture therethrough mounted on said non-rotary spindle in positions between the backing washer and said bottom wall of the chamber, said at least two friction washers mounted with convex sides in frictional abutment, one of said friction washers on the concave side thereof frictionally engaging the backing washer (**21**) at its peripheral outer edge; and wherein the other friction washer having its peripheral outer edge on the bottom wall of the chamber (**18**), each of said annular friction washers being serrated from its central aperture and radially outward.

4,534,397

METHOD FOR PRODUCING CHEMIMECHANICAL HIGH YIELD PULP USING AN OXYGEN ALKALI TREATMENT FOLLOWED BY AN OXYGEN MECHANICAL DEFIBRATION

Hans Norrström, Täby, and Kristina Idner, Dandery, both of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden

Continuation of Ser. No. 294,128, Aug. 19, 1981, abandoned, which is a continuation of Ser. No. 164,863, Jul. 1, 1980, abandoned. This application Apr. 20, 1983, Ser. No. 486,872

Claims priority, application Sweden, Jul. 10, 1979, 7905990

Int. Cl.[3] D21C *1/02, 1/16, 3/26*

U.S. Cl. 162—23 **3 Claims**

1. A method for producing chemimechanical pulp at high yield, where yield is defined as the amount of pulp obtained in relation to the input of raw material, in order to achieve strength improvement and increased absorption of liquid in end-product paper, wherein lignocellulosic material, selected from the group consisting of raw materials in the form of logs, chips, and shavings, is treated in alkaline pulping liquor, characterized in that the treatment is performed in the presence of oxygen gas and is performed in such a combination of treatment time, temperature, charge of chemicals, oxygen pressure and consistency of lignocellulosic material, that a pulp yield within the range of 80–95%, is obtained, the method further characterized in that the treatment is performed:

(a) with 1–200 Kg of alkali per ton dry lignocellulosic material,

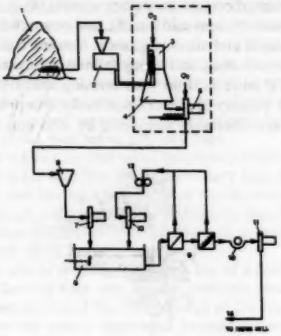
(b) at a treatment temperature between 20° and 200° C.,

(c) at an oxygen gas pressure of 1–10 kg/cm^2,

(d) with a source of alkali selected from the group consisting of NaOH, Na_2CO_3, $Mg(OH)_2$, and $MgCO_3$,

(e) at a treatment time no longer than 60 minutes, the treatment followed by the steps of,

(f) mechanically defibrating the material, and



(g) adding O_2 to the material as it is defibrated; steps (a) through (g) thereby minimizing the loss of substances.

4,534,398

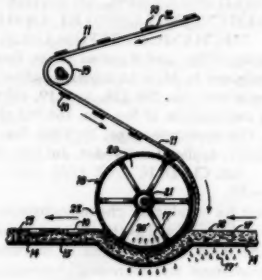
SECURITY PAPER

Timothy T. Crane, Windsor, Mass., assignor to Crane & Co., Dalton, Mass.

Filed Apr. 30, 1984, Ser. No. 605,578

Int. Cl.³ D21D *3/00*; D21H *5/10*

U.S. Cl. 162—103 **11 Claims**



1. A method of forming a security paper on a paper making machine comprising the steps of:

attaching a water impervious security device to a surface of a non-water dispersible porous carrier paper;

passing said carrier paper and security device between the outer surface of an embedment roll and wet base paper fibers to wet and press said carry paper and security device within said wet base paper fibers while drawing some of said wet base fibers and some of said water up to within said carrier paper to form a composite paper; and

pressing and heating said composite paper to form a composite paper having said security device coextensive with a surface of said composite paper.

4,534,399

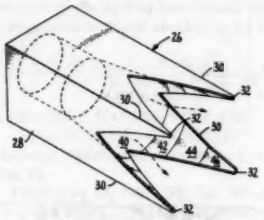
PAPER STOCK DIFFUSER SYSTEM

Conrad Steen, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Jun. 27, 1984, Ser. No. 625,278

Int. Cl.³ D21F *1/02*

U.S. Cl. 162—212 **10 Claims**



1. Apparatus for supplying paper stock to a forming surface of a papermaking machine comprising, in combination:

a stock supply chamber defining an interior;

slice means spaced from said stock supply chamber, said slice means forming a slice opening and a stock flow passageway terminating at said slice opening; and

a plurality of conduits extending between said stock supply chamber and said slice means, said conduits defining spaced stock flow paths providing communication between said stock supply chamber interior and said stock flow passageway and including discharge end sections positioned at said stock flow passageway, said discharge end sections each having a center line and including a plurality of spaced, generally V-shaped projections projecting into said stock flow passageway and positioned about a stock flow path, said projections diverging away from one another and from said center line so that the apices of the projections of each end section are further apart than the bases thereof, and said discharge end sections each defining a plurality of adjoining shear surfaces radially disposed about said center line and extending seriatim along the lengths of said projections to the apices thereof, the shear surfaces of each discharge end section diverging away from the center line thereof at increasing angles in the direction of the projection apices.

9. A method of treating paper stock being delivered from a stock supply source to a stock flow passageway terminating at a slice opening, said method comprising the steps of:

establishing a plurality of separate flow paths having spaced center lines between said stock supply source and said stock flow passageway;

flowing said paper stock in said flow paths;

directing the paper stock from said flow paths into said stock flow passageway;

expanding said flow paths to provide a plurality of adjoining shear surfaces radially disposed about said center lines and diverging away from the center lines at progressively increasing angles;

flowing said paper stock along and in engagement with said adjoining shear surfaces whereby said paper stock in said flow paths diffuses and radiates outwardly away from said center lines in adjoining, consecutive, incremental angular steps; and

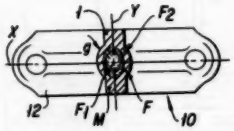
simultaneously with the step of flowing said paper stock along and in engagement with said adjoining shear surfaces, gradually continuously increasing contact between the outer peripheral surface of said flowing paper stock and paper stock already in said stock flow passageway, whereby variable shear conditions are created and said flowing paper stock is defloced and deagglomerated.

4,534,400

METHOD FOR MAKING A REINFORCED ARTICLE FOR AN INTERNAL COMBUSTION ENGINE

Keisuke Ban, Fujimi, and Akimasa Daimaru, Omiya, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,502
Claims priority, application Japan, Sep. 16, 1981, 56-145990
Int. Cl.³ B22D *19/14*
U.S. Cl. 164—97 **9 Claims**



1. Method of making a connecting rod for an internal combustion engine, said rod having a first semi-annular end portion, a second annular end portion, and a rod portion therebetween, said second annular portion having a center axis, said rod portion having a longitudinal axis, an X-axis perpendicular to said longitudinal axis and perpendicular to said center center axis, and a Y-axis perpendicular to said longitudinal axis and parallel to said center axis, said method comprising the steps of:

shaping a bundle of inorganic reinforcing uni-directional fibers

such that a second moment of area of the bundle about the Y-axis (I(c) y) taken across a cross-section perpendicular to the longitudinal axis is less than a second moment of area of the bundle about the X-axis (I(c) x),

positioning said bundle in a mold, said mold having cavities to form said semi-annular portion, said annular portion and said rod portion, the cavity to form the rod portion being sized such that the second moment of area of the finished rod about the X-axis (Ix) is greater than the second moment of area of the finished rod about the Y-axis (Iy), said bundle being positioned to bridge from said cavity for said semi-annular portion and to produce a fixed minimum gap between said bundle and the cavity for said rod portion; and

squeeze casting a molten light metal alloy into said mold forming a matrix of said alloy and said bundle.

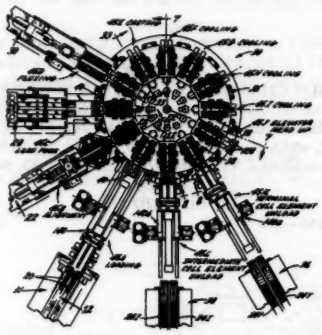
4,534,401

APPARATUS AND METHOD FOR CASTING STRAPS ON BATTERY CELL ELEMENTS

Edward G. Schaumburg, Askov; Cory D. Benson, Bloomington; Alby H. Wolf, Minneapolis, and Michael G. Zais, Richfield, all of Minn., assignors to GNB Batteries Inc., Mendota Heights, Minn.

Filed May 21, 1982, Ser. No. 380,785
Int. Cl.³ B22D *19/00*
U.S. Cl. 164—102 **63 Claims**

1. An apparatus for casting straps onto rows of lugs of battery cell elements comprising an indexable table having a plurality of stations at circumferentially spaced locations about the periphery of said table; said table stations each including an element holding head and a mold formed with a lug strap cavity; means mounting each said head on said table at an elevated position above the respective table station mold, said head for each table station having means for releasably engaging an element and being mounted on said table for movement between an elementreceiving position with the lugs of the element held therein disposed above the mold of said table station and a casting position with the lugs of an element held therein disposed in said mold; means for indexing said table to simultaneously and successively move said table stations to a plurality of operating stations located immediately adjacent the periphery of said table including an element loading station where an element is positioned into a table station head upon indexing of table station to said loading station, a molten-metal pouring station having means for dispensing a determined amount of molten metal into a table station mold upon indexing of the respective table station to said pouring station and while an element is held in the head, and an unloading station where



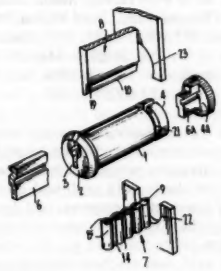
elements with straps cast thereon are removed from said head; means for moving each said head and an element held therein to said casting position following dispensing of molten metal into said mold at said pouring station; and means for returning each said head to said element-receiving position to permit removal from said head of an element with straps cast thereon at said unloading station.

4,534,402

METHOD OF CASTING PIN TUMBLER LOCK BARRELS

John R. Watts, 116 North Rd., Brighton, Vic. 3186, Australia

Filed Mar. 24, 1983, Ser. No. 478,273
Claims priority, application Australia, Mar. 29, 1982, PF3367; Jul. 6, 1982, PF4713
Int. Cl.³ B22D *13/00, 33/04*
U.S. Cl. 164—302 **6 Claims**



1. Apparatus for diecasting a barrel for a pin tumbler lock, said apparatus comprising, a die having a generally barrel shaped cavity incorporating at least three retractable cores, a first core retractable axially with respect to the center-line of the barrel and defining the entry hole and guide channel for a key designed to operate a lock having the barrel as a component thereof, said first core in the extended position extending into the barrel no further than the guide channel for a first pin, a second core, and a third core, said second and third cores comprising the only cores which are retractable radially with respect to the center-line of the barrel and positioned substantially diametrically opposite one another and extending into the barrel so as to be placed in close proximity to one another

and to said first core when all three cores are fully extended during casting, said second core comprising a central web and a plurality of pairs of opposed protrusions on either side thereof, each pair of opposed protrusions defining a guide channel for a pin, and said third core in conjunction with said second core defining an axial inwardly projection fin adapted to mate with a channel in the key, one side of said fin being defined by said second core and the other side by said third core.

4,534,403

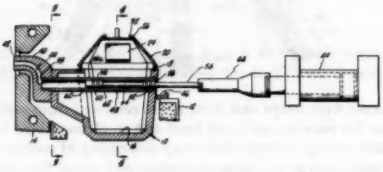
HOT CHAMBER DIE CASTING MACHINE

John I. Harvill, 24201 Orange Ave., Perris, Calif. 92370

Continuation-in-part of Ser. No. 386,340, Jun. 8, 1982, Pat. No. 4,476,912, which is a continuation of Ser. No. 196,319, Oct. 14, 1980, abandoned. This application Apr. 18, 1983, Ser. No. 485,653

Int. Cl.³ B22D *17/02*

U.S. Cl. 164—316 **22 Claims**



1. A hot chamber die casting machine comprising a pot;
a cylinder extending horizontally through said pot and having a first, open end on a first outer side of said pot;
a piston slidably mounted in said cylinder;
means for cooling said first, open end and no other part of said cylinder to a temperature below the melting point of metal die casting material.

4,534,404

MACHINE FOR CONTINUOUSLY CASTING BATTERY GRIDS

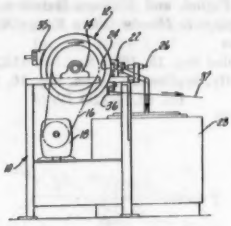
Jack E. McLane; Raymond L. Schenk; Robert R. Rader, and John W. Wirtz, all of Port Huron, Mich., assignors to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

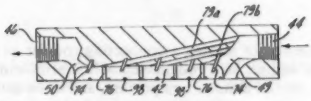
Division of Ser. No. 517,668, Jul. 27, 1982, Pat. No. 4,509,581, which is a division of Ser. No. 380,056, May 20, 1982, Pat. No. 4,415,016. This application Nov. 8, 1984, Ser. No. 669,520

Int. Cl.³ B22D *11/10*

U.S. Cl. 164—429 **3 Claims**

1. In a machine for continuously casting battery grids, the machine including a drum adapted to be rotated in one direction and having on its outer peripheral surface a cavity which defines the pattern of the battery grid, said grid pattern comprising two sets of intersecting grooves, said grooves defining pads therebetween which form the outer peripheral surface of the drum and which define the open spaces between the wires of the cast battery grid, said machine including a shoe having an arcuate surface in mating engagement with said pads around an arcuate segment of the drum, said shoe having an orifice slot therein which is axially co-extensive with said cavity and which is open at the portion of said arcuate surface that is intermediate the circumferentially opposite ends of the shoe, said shoe having an inlet and an outlet communicating with the axially opposite ends of the orifice slot, said machine also including means for directing molten lead at superatmospheric pressure to said inlet in an amount in excess of that required to progressively fill the grid cavity as it rotates past the opening in the orifice slot so that the excess is discharged through said outlet, that improvement which comprises at least one by-pass passageway extending through said shoe directly from the inlet end of the orifice slot to a section thereof intermediate its opposite ends so that a portion of the hot molten lead introduced to the inlet of the shoe is bypassed directly to said intermediate section thereby tending to maintain the temperature of





the lead more uniform throughout the axial extent of the orifice slot.

4,534,405

METHOD AND AN ARRANGEMENT FOR INSPECTING THE SURFACE OF STEEL STOCK HAVING A TEMPERATURE ABOVE THE CURIE POINT

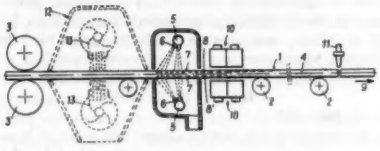
Anton Hulek, Linz, and Wolfgang Polanschütz, Leoben, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jan. 26, 1983, Ser. No. 461,268

Claims priority, application Austria, Feb. 11, 1982, 515/82

Int. Cl.³ B22D *2/00*

U.S. Cl. 164—451 **13 Claims**



1. A method for inspecting the surface of continuously cast steel stock having a temperature above the Curie point and including a hot core and a surface layer which method comprises the steps of intensively cooling only a slight depth of said surface layer at said surface to be inspected to a temperaure below the Curie point and above 500° C. with a substantial portion of the core remaining at a temperature above the Curie point,
inducing a magnetic field in the cooled surface layer immediately afterwards, and
detecting and recording, by means of pick-ups, disturbances of said magnetic field caused by defects in said steel stock.

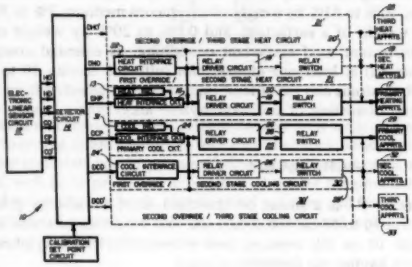
4,534,406
THERMOSTAT

Alfred T. Newell, III, and Alfred T. Newell, Jr., both of Birmingham, Ala., assignors to A. T. Newell Co. Inc., Birmingham, Ala.

Continuation-in-part of Ser. No. 584,398, Feb. 28, 1984. This application Jun. 28, 1984, Ser. No. 625,606

Int. Cl.³ F25B *29/00*; **G08B** *17/00*

U.S. Cl. 165—12 **18 Claims**



1. An electronic thermostat, comprising

means for sensing temperature;

a reference terminal for connection with a common reference potential, such as ground;

a heat control terminal for connection with a control relay coil of a heating apparatus;

a cool control terminal for connection with a control relay coil of a cooling apparatus;

a switch for preselecting one of said control terminals;

means for applying actuation signals to the preselected one of said control terminals to energize a control relay connected therewith;

means for providing D.C. power to said actuation signal generating means from A.C. power drawn through the other nonselected and non-actuated control terminal at a level insufficient to energize a relay control coil of a temperature altering apparatus connected therewith.

4,534,407
HEAT EXCHANGERS

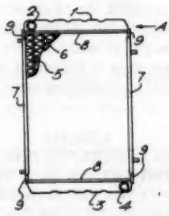
Graham G. Lardner, Llanelli, Wales, assignor to Unipart Group, Limited, Cowley, England

Filed Aug. 30, 1983, Ser. No. 527,810

Claims priority, application United Kingdom, Sep. 3, 1982, 8225112; Apr. 14, 1983, 8310087

Int. Cl.³ F28F *7/00*

U.S. Cl. 165—81 **3 Claims**



1. A heat exchanger, said heat exchanger comprising a pair of header tanks formed from a plastic material and having axially rigid arms molded integrally therewith; a matrix including a plurality of tubes extending between the header tanks and airways located between the tubes, and clamping members which are substantially box-shaped in cross-section disposed parallel to the tubes on each side of the matrix; said axially rigid arms extending into the clamping members and having a telescoped sliding fit thereon whereby each clamping member is in contact with the matrix but each of the arms can slide relative to its associated clamping member in a direction parallel to the tubes.

4,534,408
INDUCTION DEVICE FITTED INSIDE A TANK FOR DRAWING IN FLUIDS SUCH AS LIQUID FUELS

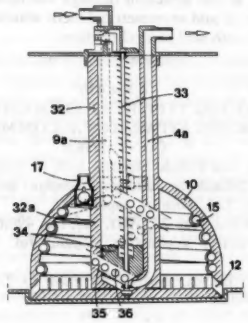
Bernard Thibonnet, 1, Allée de la Vigie, Carry le Rouet, France (13620), assignor to Bernard Thibonnet, Carry le Rouet, France; Philippe H. Staib, Bangkok, Thailand and Jean-Michel Babet, Paris, France

Filed Jan. 18, 1983, Ser. No. 458,746

Claims priority, application France, Jan. 25, 1982, 82 01114

Int. Cl.³ F28F *9/00*

U.S. Cl. 165—108 **10 Claims**



1. Fluid induction device for use with liquid fuel, fitted inside a tank for drawing in liquid fuels in particular, wherein said device comprises an enclosure **(10)** provided at its base with first communicating means and at its upper part with second means of communicating with the tank, said enclosure **(10)** containing, on the one head, an induction pipe **(13)** of a pump and on the other hand, a conduit **(15)** adapted to receive heated fluid ensuring the heating of the enclosure, characterized in that the enclosure **(10)** is resting on a dish member **(11)** at the bottom of the tank, in that the first communicating means is formed by vertical directional slots **(12)** situated at the base of said enclosure, in that the second means of communicating with the tank extends downwardly into the interior of said enclosure, said second means including a floating member **(20)** shiftable between sealing and unsealing positions of said second means in the filled and unfilled conditions respectively of said enclosure, and in that the induction pipe **(13)** comprises an end portion **(13a)** which is bent towards the top part of the enclosure and comprises a series of orifices **14** distributed throughout its length.

4,534,409
TUBULAR HEAT EXCHANGER AND HELICAL AGITATORS FOR USE WITH SUCH EXCHANGERS

Patrick Cadars, Montigny-le-Bretonneux, France, assignor to Societe Anonyme Francaise Du Ferodo, Paris, France

Filed May 20, 1980, Ser. No. 151,565

Claims priority, application France, May 25, 1979, 79 13362

Int. Cl.³ F28F *1/40, 13/12*

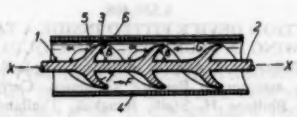
U.S. Cl. 165—109 T **1 Claim**

1. A heat exchanger comprising:

(a) at least one tube through which a fluid may flow and an agitator comprising at least two continuous helical threads located in the tube,

(b) the section through the agitator in any plane passing through the longitudinal axis of the helical continuous threads having a central portion and teeth of the same shape and dimensions spaced along the longitudinal axis,

(c) each of these teeth shown in section being asymmetrical with respect to a line perpendicular to the longitudinal axis of the helical continuous threads,



(d) each of said teeth having two sides respectively forming with said central portion an obtuse angle α and an acute angle β different from $180° - \alpha$,

(e) the agitator being arranged in the tube such that fluid flowing in one direction through the tube strikes against the sides of said asymmetrical teeth which form the acute angle β with said central portion.

4,534,410

AIR COOLING TYPE HEAT EXCHANGER FOR A REFRIGERATING APPARATUS ACCOMMODATED IN A CONTAINER

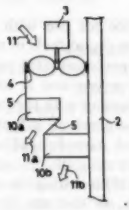
Shin Watabe, and Hideto Shibata, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki and Churyo Engineering Co., Ltd., both of, Japan

Filed May 27, 1983, Ser. No. 498,698

Claims priority, application Japan, Jul. 12, 1982, 57-104333[U]

Int. Cl.³ F24B *1/06*; F28F *13/12*

U.S. Cl. 165—126 **5 Claims**



1. A refrigerating apparatus comprising:

a container defining a space and including at least one wall;

a fan for blowing cooling air in an air flow direction in the container space; and

an air cooling type heat exchanger disposed in the container space downstream of said fan in the air flow direction, said heat exchanger comprising a plurality of segments which are arranged in stepped relationship, said plurality of segments including at least one upstream segment and at least one downstream segment adjacent to said upstream segment and downstream of said upstream segment with respect to said air flow direction, said upstream segment partly overlapping said downstream segment in a direction transverse to said air flow direction and being spaced from said downstream segment in said air flow direction, including a flow shielding plate connected between said upstream segment and said downstream segment and extending in an inclined position with respect to said air flow direction whereby air blown by said fan in said air flow direction is selectively divided by said flow shielding plate into at least two discrete streams, the first of said streams flows through said upstream segment and the second of said streams flows through said downstream segment.

4,534,411

MICELLAR SLUG FOR OIL RECOVERY

Hiroshi Morita, Chiba; Yasuyuki Kawada, Funabashi; Junichi Yamada, Narashino, and Toshiyuki Ukigai, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,602

Claims priority, application Japan, Mar. 16, 1982, 57-040290

Int. Cl.³ E21B *43/22*

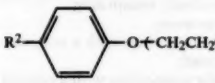
U.S. Cl. 166—274 **2 Claims**

1. A micellar slug for use in the recovery of oil, said slug consisting essentially of 4% to 90% by weight of a hydrocarbon, 10% to 92% by weight of an aqueous medium, 3% to 30% by weight of a surfactant, and 0.1% to 20% by weight of a cosurfactant, said surfactant containing, as essential components, (a) at least one alpha-olefin sulfonate having 10 to 30 carbon atoms and (b) at least one ethoxylate selected from the group consisting of polyoxyethylene alkyl ethers having the formula:

$$R^1O\text{-}(CH_2CH_2O)_mH \quad (I)$$

wherein R^1 is a linear or branched alkyl or alkenyl group having 10 to 18 carbon atoms and m is a number of about 1 to about 10 on the average, and polyoxyethylene alkylphenyl ethers having the formula:

(II)



wherein R^2 is a linear or branched alkyl group having 6 to 15 carbon atoms and n is a number of about 1 to about 15 on the average, in a weight ratio of component (a) to component (b) of 8/2 to 3/7.

4,534,412

CONTINUOUS PERMEABILITY REDUCTION IN SUBTERRANEAN RESERVOIRS

Hoai T. Dovan, Brea, and Richard D. Hutchins, Placentia, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 9, 1983, Ser. No. 559,920

Int. Cl.³ E21B *33/138*

U.S. Cl. 166—295 **48 Claims**

1. A method for reducing the permeability of the higher permeability zones of a subterranean reservoir having heterogenous permeability penetrated by at least one well comprising injecting through a well and into said reservoir a composition of matter comprising in an aqueous liquid (1) a water-soluble or water-dispersible polymer; (2) a crosslinking agent for the polymer capable of reacting with said polymer to produce a gel in an alkaline media; (3) a source of hydroxyl ions in an amount sufficient to retard the reaction of said polymer with said cross-linking agent; and (4) an additive capable of sufficiently reducing the pH of said aqueous liquid at an ambient elevated temperature so as to initiate or accelerate reaction of said polymer and said cross-linking agent.

4,534,413

METHOD AND APPARATUS FOR WATER FLOW STIMULATION IN A WELL

Igor Jaworowsky, P.O. Box 157, Branchville, N.J. 07826

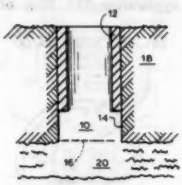
Filed Dec. 27, 1983, Ser. No. 565,855

Int. Cl.³ E21B *36/00, 43/26*

U.S. Cl. 166—302 **8 Claims**

1. The method of stimulating the flow of water into a well from water pools trapped in the strata surrounding such well comprising the steps of: placing a cap on the casing of said well and sealing by securing said cap thereto; introducing a liquified gas or non-liquified gas into said well through said cap to

freeze water in said well and in said strata surrounding said well; maintaining said liquified gas or non-liquified gas under pressure in said well to permit the pressurizing of water in said well and in the surrounding strata; and rapidly decreasing the pressure in said well allowing for the rapid freezing of any water in said well and in said surrounding strata not previously

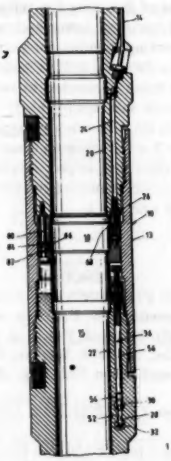


frozen, and removing the pressure on said well walls and said surrounding strata permitting any fractured rock, sand, dirt or other materials in said passages between said water pools and said well to be propelled into said well, under the pressure of said trapped water pools, cleaning said passages and facilitating the flow of water from said water pools into said well.

4,534,414
HYDRAULIC CONTROL FLUID COMMUNICATION NIPPLE

Ronald E. Pringle, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 440,667, Nov. 10, 1982, Pat. No. 4,460,046. This application Dec. 27, 1983, Ser. No. 565,324
Int. Cl.³ E21B *34/10*
U.S. Cl. 166—317 **6 Claims**



1. A hydraulic control fluid communication nipple for switching control fluid from one location to a second location in a well tool comprising,

a body,

a fluid passageway in the body adapted to be connected to the well surface for normally receiving hydraulic control fluid for supplying hydraulic control fluid to a first location,

vertically moving means in the body shutting off communication of fluid to said first location,

said vertically moving means in the body opening communication of said fluid passageway to a second location in the body,

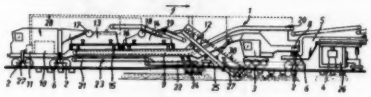
a metal plug aligned with a portion of said fluid passageway and positioned to be engaged by the vertically moving means and moved into said portion and shut off communication of fluid to said first location with a metal seal,

said metal plug has a longitudinal axis extending vertically and is threadedly connected in the passageway forming a metal seal and having a frangible connection.

4,534,415
BALLAST CLEANING MACHINE WITH TWO BALLAST SCREENING INSTALLATIONS

Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed Jun. 21, 1983, Ser. No. 506,297
Claims priority, application Austria, Sep. 20, 1982, 3503/82
Int. Cl.³ E01B *27/00*
U.S. Cl. 171—16 **9 Claims**



1. In a mobile ballast cleaning machine comprising a frame, undercarriages supporting the frame for mobility on a track resting on the ballast, an arrangement toward the forward end of the frame for excavating the ballast and for conveying the excavated ballast, the ballast excavating and conveying arrangement being vertically adjustably mounted on the frame and including a driven endless chain for excavating and conveying the ballast and a polygonal guide for guiding the driven chain, the guide having a transverse section and at least one section leading rearwardly from the transverse section in a longitudinal direction along the frame, a first vibratory and vertically adjustable ballast screening installation mounted on the frame and extending rearwardly from the excavating and conveying arrangement, and having an inlet to receive the conveyed ballast from an output of the ballast excavating and conveying arrangement and to separate the ballast into a cleaning ballast component and a waste component, and conveyor means for redistributing the cleaned ballast component and for removing the waste component; a further ballast screening installation mounted on the frame rearwardly of and adjacent the first ballast screening installation, separate drive means for vibrating and for vertically adjusting the further ballast screening installation, and a remote-controllable conveyor means arranged to receive the ballast from the ballast excavating and conveying arrangement output and to deliver it to the first ballast screening installation and upon selective adjustment of a remote-controllable portion of the remote-controllable conveyor means to also deliver ballast from the ballast excavating and conveying arrangement to an inlet of the further ballast screening installation.

4,534,416
AUTOMATIC LOCK FOR FARM EQUIPMENT TRANSPORT WHEEL

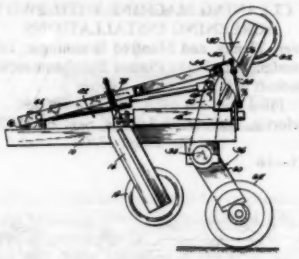
Terry L. Johnson, Brillion, Wis., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Nov. 7, 1983, Ser. No. 548,963
Int. Cl.³ A01B *63/22*
U.S. Cl. 172—311 **14 Claims**

1. In a tractor-drawn farm implement of the type having a main frame, soil working tools mounted on said frame, a wheel assembly pivotally mounted on said frame and including a wheel and an actuating arm, means for actuating said arm to move said wheel between a raised field position in which said tools contact the ground and a transport position in which the wheel engages the ground and said tools are raised from the ground, a wing frame pivoted on said main frame for pivotal movement between a laterally extended position and a folded position in which the wing frame has pivoted inwardly at least 90° from said extended position, soil working tools mounted on

said wing frame, means for actuating said wing frame between its positions, the improvement comprising,

a separate releaseable lock member engageable with said arm,



means responsive to movement of said wing frame to said folded position to move said lock member into a lock position in which it is engageable with said arm.

4,534,417

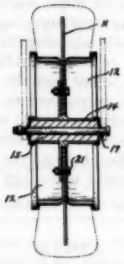
GAUGE WHEEL CONVERSION ARRANGEMENT

Floyd V. Weatherholt, R. 3, Box 34A, Rockport, Ind. 47635

Filed Jul. 17, 1978, Ser. No. 925,214

Int. Cl.³ A01B *23/06, 51/00;* **B60B** *3/08*

U.S. Cl. 172—536 **1 Claim**



1. A gauge wheel for agricultural cultivating equipment, said gauge wheel comprising a hub, a radially extending mounting projection on said hub, said wheel further comprising a pair of substantially identical mounting plates each including outer axially extending tire supporting flanges terminating in an annular radially extending tire retaining rim between which a tire may be received and retained, and a separable cutting blade adapted to be substituted for said tire and sized to be disposed between said mounting plates and extending radially beyond said outer rims thereof, whereby said mounting plates with said separable cutting blade therebetween may be assembled and secured to said mounting projection on said hub by fastening means extending through said plates and said cutting wheel to selectively convert the gauge wheel into a cutting wheel.

4,534,418

SPRING TEETH

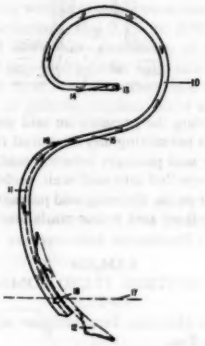
Fritz Hegemann, and Horst Beilhammer, both of Werdohl, Fed. Rep. of Germany, assignors to Krupp Brüninghaus GmbH, Werdohl, Fed. Rep. of Germany

Filed Dec. 6, 1982, Ser. No. 447,259

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 3148260

Int. Cl.³ A01B *23/00*

U.S. Cl. 172—708 **10 Claims**



1. A spring tine for an agricultural implement for soil cultivation, comprising: a bent spring blade having an upper end constituting a point of fastening for releasable attachment to the implement and having a lower end; and a carrier for the attachment of a working member for performing soil cultivation which causes a force to act on said tine along a line of action, said carrier being connected to said lower end of said spring blade; wherein said spring blade has a cross section which varies over its length in such a manner that the axial area moment of inertia I of a cross-sectional plane, divided by one-half the blade thickness, is proportional to the linear distance of that cross-sectional plane from the line of action of the force acting on said tine.

4,534,419

METHOD FOR PILE DRIVING AND DRAGGING

Gülertan Vural, Emmelshausen, Fed. Rep. of Germany, assignor to Koehring GmbH, Boppard, Fed. Rep. of Germany

Filed Jul. 20, 1978, Ser. No. 926,228

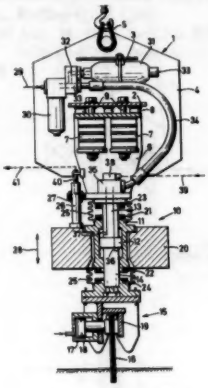
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732934

Int. Cl.³ E02D *7/10, 7/18*

U.S. Cl. 173—1 **8 Claims**

1. A method for driving a body into the ground by means of a single hammer which is driven by a double acting piston-cylinder unit supplied with a controlled, periodically changing stream of pressure medium and which generates forces which act on the body in its longitudinal direction, the piston-cylinder unit including two parts movable relative to one another under the influence of the pressure medium, with one of the parts being secured to the hammer and the other of the parts being secured to a reaction mass, comprising: initially causing the pressure stream to have an approximately sinusoidally pulsating form for imparting a vibratory movement to one part and the hammer; relative to the other part; monitoring the relative movement between the two parts; when the speed with which the body is being driven into the ground decreases to below a given minimum value, causing the pressure medium to be controlled to displace the other part and the reaction mass relative to the one part according to a periodic, approximately

unsteady displacement-time function for causing the reaction mass to apply a hammering movement to the hammer; and



during occurrence of such hammering movement, simultaneously determining the hammering energy being generated.

4,534,420

ELECTRIC TOOL WITH TORQUE MONITOR

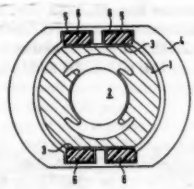
Rainer Goldelius, Idstein, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Oct. 26, 1982, Ser. No. 436,766

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142682

Int. Cl.³ B23Q *17/00*

U.S. Cl. 173—12 **9 Claims**



1. An electric tool having an electric motor, said electric motor comprising:

a housing;

a stator mounted inside said housing;

support means, inside said housing and extending between said housing and said stator, for supporting said stator in said housing and transmitting the reaction torque of said motor to said housing;

a pressure sensor incorporated in said support means;

said pressure sensor comprising a platelet of electrically conductive plastic material, the resistance of the latter changing as a function of the pressure exerted upon it, disposed between two electrodes;

said pressure sensor being subjected to said reaction torque to change the resistance of said conductive plastic material, whereby said change in resistance of said conductive plastic material can be used in controlling said motor;

two such pressure sensors between which a support element is disposed, one of said support element and said pressure sensors being fastened to said stator, and the other connected to by said housing, whereby one of said pressure sensors is subject to the reaction torque of the motor in one direction of drive of the latter and the other of said pressure sensors is subject to the reaction torque of the motor in the opposite direction of drive of the latter; and

said two pressure sensors are contained in a common enclosure, and wherein said support element protrudes outwardly through an opening in said enclosure.

4,534,421

TOOL ASSEMBLY

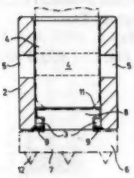
David T. Allan, 9 Broomhill Dr., Glasgow, Scotland

Filed Aug. 5, 1982, Ser. No. 405,937

Claims priority, application United Kingdom, Aug. 28, 1981, 8126367; Dec. 1, 1981, 8136259; Dec. 10, 1981, 8137242

Int. Cl.³ E21C *35/02*

U.S. Cl. 173—130 **13 Claims**



1. A tool assembly comprising:

a piston;

a diametric aperture through said piston;

a sleeve around the piston;

a pair of diametrically opposed apertures in said sleeve corresponding to the aperture in said piston;

a locking pin through said apertures;

a pair of inwardly directed flanges on a lower part of said sleeve; and

a tool holder having a lower portion carrying a plurality of tool bits and a substantially rectangular upper portion formed with a pair of outwardly directed flanges, the arrangement being such that when said locking pin is in said apertures the upper surface of the tool holder abuts an end face of the piston and said flanges on the upper portion of the tool holder are a tight fit between said end face of the piston and opposing faces on the flanges of the sleeve.

4,534,422

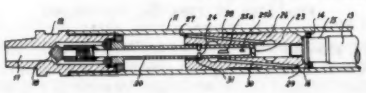
FLUID OPERATED HAMMER

Ian G. Rear, 53 Louise St., Nedlands, Western Australia, Australia

Continuation of Ser. No. 277,048, Jun. 24, 1981,. This application Sep. 20, 1983, Ser. No. 533,952

Int. Cl.³ E21B *4/14*

U.S. Cl. 173—134 **20 Claims**



1. In a fluid operated hammer drill comprising a casing defining a bore, means including a drill bit supporting member for closing one end of said bore, a hammer piston having oppositely facing first and second ends reciprocally supported in said bore for movement from a retracted position wherein said second piston end is spaced from said one end and an impact position at said one end wherein said first piston end impacts said drill bit supporting member, and a fluid pressure inlet, the improvement comprising porting means in fluid communication with said fluid pressure inlet and opened and closed

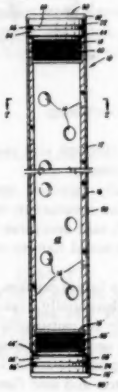
responsive to the relative position of said hammer piston for pressurizing said first end of said hammer piston when said hammer position is contiguous to said one end for driving said hammer piston away from said one end toward its retracted position, for pressurizing the second end of said piston when said piston is at first distance from said one end and contiguous to said retracted position, and for pressurizing said second end of said hammer piston again when said hammer piston is closely adjacent said one end, but spaced from its impact position toward said retracted position and from the point of said first mentioned pressurization of said second end.

4,534,423

PERFORATING GUN CARRIER AND METHOD OF MAKING

John A. Regalbuto, Forth Worth, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Filed May 5, 1983, Ser. No. 491,624
Int. Cl.³ E21B *43/11*
U.S. Cl. 175—4.6 **19 Claims**



1. A perforating gun carrier comprising:
in inner substantially tubular housing having a plurality of gun ports extending through the wall thereof; and
an outer substantially tubular sleeve surrounding said inner housing in substantially circumferential contact therewith and covering said plurality of gun ports, said sleeve being imperforate proximate said housing gun ports.

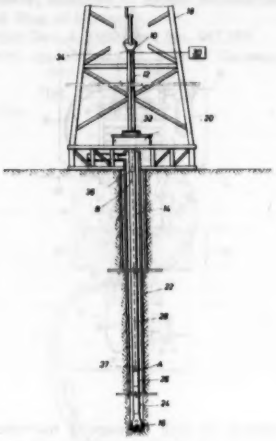
4,534,424

RETRIEVABLE TELEMETRY SYSTEM

Mark S. Ramsey, Spring, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Mar. 29, 1984, Ser. No. 594,605
Int. Cl.³ E21B *7/00, 47/12*
U.S. Cl. 175—40 **15 Claims**

1. A method of installing and retaining a conductor between a surface terminal and a subsurface location in a drill string used to drill a well, comprising the steps of:
lowering a mating end of the conductor into the drill string by paying out the conductor from its other, control end until the mating end reaches the subsurface location;
anchoring the mating end of the conductor to the drill string at the subsurface location;
tensioning the conductor;
measuring the tension of the conductor;
connecting the control end of the conductor to the surface terminal; and
controlling the tension of the conductor, as a drill pipe section is added to the drill string to advance the depth of the well, by connecting a conductor section between the surface terminal and the control end of the conductor, wherein the length of the conductor section at a tension



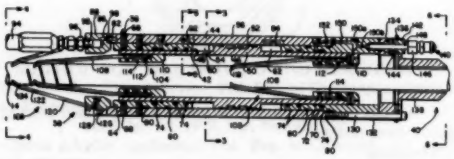
corresponding to the measured tension of the conductor is less than the length of the pipe section to be added to the drill string.

4,534,425

CABLE REAMING APPARATUS AND METHOD

James M. Reichman, Issaquah; Thomas A. O'Hanlon, Tacoma, both of Wash., and Thomas J. Kendrew, Redwood City, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 196,847, Oct. 14, 1980, Pat. No. 4,385,667.
This application Feb. 25, 1983, Ser. No. 469,920
The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.
Int. Cl.³ E21B *4/02*
U.S. Cl. 175—53 **2 Claims**



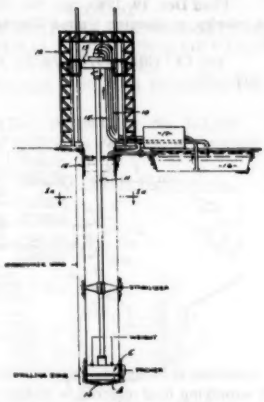
1. An apparatus for following along and around the length of an existing cable, said apparatus comprising: an open ended tubular main body adapated to be positioned concentrically around the cable; means for interconnecting said main body to said cable such that said body is slidably movable along the length of said cable from one end of the latter to its other end, said interconnecting means including a plurality of gripping members fixedly connected with said main body and slidably engagable against said cable for maintaining said main body in its concentric position around said cable as it moves along the latter; and means for slidably moving said main body along said cable; said tubular main body including inner and outer concentric, cylindrical sections axially slidable to a limited extent to and against one another; said gripping members being designed to engage said cable such that said main body is movable in a forward direction; and said moving means acting on said inner and outer body sections to cause the latter to alternately slide relative to one another in incremental steps along said cable.

4,534,426

PACKER WEIGHTED AND PRESSURE DIFFERENTIAL METHOD AND APPARATUS FOR BIG HOLE DRILLING

David W. Hooper, Huntington Beach, Calif., assignor to Unique Oil Tools, Inc., Rolling Hills, Calif.

Filed Aug. 24, 1983, Ser. No. 525,998
Int. Cl.³ E21B 7/00, 17/00
U.S. Cl. 175—65 70 Claims



1. A packer weighted and pressure differential method of big hole well bore drilling through earth formation having a pore pressure opposed by hydrostatic head pressure, and including;

advancing a large digmeter drill bit at the lower end of a dual drill pipe of substantially smaller diameter and isolating the flow of circulating fluid therethrough to and from the drill bit,

sliding a bore engaging packer down the well bore and rotatably over the dual drill pipe following the drill bit, and thereby separating the well bore into a drilling zone surrounding the drill bit and a hydrostatic head of fluid maintained in the well bore annulus above the packer and surrounding the dual drill pipe,

applying the weight of said hydrostatic head to the drill bit through axial thrust bearing means transferring said weight from the sliding packer to and throughout the large diameter drill bit,

and significantly reducing the fluid pressure within the said drilling zone responsive to controlled pressure release of the circulating fluid,

whereby the large diameter drill bit is weighted to bear against a bit-to-bore bottom interface and the drilling zone subjected to an underbalanced condition as compared to the fluid pressure immediate to and above the sliding packer in the well bore annulus surrounding the dual drill pipe.

4,534,427

ABRASIVE CONTAINING FLUID JET DRILLING APPARATUS AND PROCESS

Fun-Den Wang, 108 S. Eldrige Way, Golden, Colo. 80401, and Gene G. Yie, 29244 - 59th Ave. South, Auburn, Wash. 98002

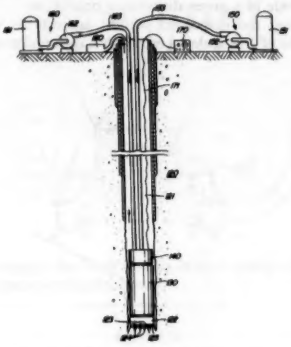
Filed Jul. 25, 1983, Ser. No. 517,000
Int. Cl.³ E21B 7/18
U.S. Cl. 175—67 20 Claims

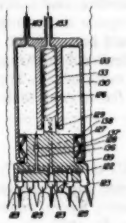
1. Apparatus for drilling holes in rock comprising:

a rotary drill bit having multiple abrasive-fluid jet nozzles mounted in the face of said bit having their center of flow at about 20 to about 90 degrees to said face and spaced to cut concentric grooves in said rock upon rotation, and mechanical cutters mounted in said face of said bit and spaced between said fluid jet nozzles to remove remaining material between said grooves upon rotation;

a stationary drill head housing torque generation means and rotary mounting means holding said rotary drill bit beneath and in rotatable relation to said drill head;

high pressure liquid supply means for supplying pressurized





liquid through flexible hoses to liquid orifices in a central portion of each said abrasive-fluid jet nozzles at over 10,000 psi; and

abrasive supply means for supplying through flexible hoses abrasive separate from and downstream from the supply of said liquid and peripheral to the central portion of each said abrasive-fluid jet nozzles.

4,534,428

VIBRATORY FEEDER CONTROL FOR A WEIGHING SYSTEM

Oren A. Mosher, Hayward, and Ellwood S. Douglas, Orinda, both of Calif., assignors to Package Machinery Co., East Longmeadow, Mass.

Filed Aug. 11, 1983, Ser. No. 522,418
Int. Cl.³ G01G 19/22, 19/32
U.S. Cl. 177—1 16 Claims

11. A method of operating a combination weighing machine having a plurality of weigh scales from which a preferred combination of scales is selected during each machine cycle to form a package of product at an approximate target weight comprising:

monitoring each of the scales in the machine and identifying scales which have become inactive by not dumping product for a plurality of consecutive machine cycles; and

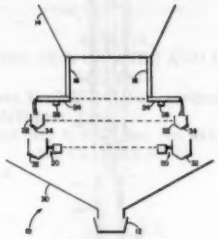
reducing to a small amount the quantity of product fed to scales requiring reloading during subsequent machine cycles until the identified inactive scales are dumped.

14. A method of controlling a plurality of vibratory feeders which dispense quantities of product in different and controlled amounts from a bulk container to a plurality of associated weigh scales in a combination weighing machine to weigh

the quantities being selected in various combinations from the scales in each cycle of machine operation and form a single quantity of product at or closely approximating a given target weight, the different and controlled amounts of product dispensed being regulated by the vibrations of the feeders, comprising for each scale the steps of:

measuring the weight of product dispensed from a feeder to the scale in a given dispensing operation;

comparing the dispensed weight against the desired feed weight of the scale to establish a difference; and



setting the vibrations of the feeder for the scale to regulate the different and controlled amounts of product dispensed in advance of feeding and independently of the other feeders in a subsequent dispensing operation and to minimize the difference between the weight of product dispensed and the desired feed weight whereby statistically varying weights more closely approximating the desired feed weights are fed to each scale.

4,534,429

COMBINATORIAL WEIGHING APPARATUS

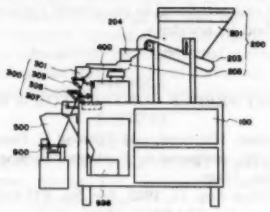
Satoshi Konishi, Kusatsu, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Mar. 18, 1983, Ser. No. 476,719

Claims priority, application Japan, Mar. 20, 1982, 57-045282; Mar. 20, 1982, 57-39628[U]; Mar. 20, 1982, 57-39629[U]; Mar. 20, 1982, 57-39630[U]

Int. Cl.³ G01G *19/22, 19/52, 13/22*

U.S. Cl. 177—25 **2 Claims**



1. A combinatorial weighing apparatus, comprising

a base;

a plurality of hoppers mounted on said base;

supply means, for supplying articles to the hoppers, including

a supply belt, mounted on the base, the supply belt having an angle of inclination with respect to the base;

a charging hopper, mounted on the base, the charging hopper having an outlet port located above the supply belt;

an angle adjusting mechanism connected to the charging hopper and the supply belt; and

a partitioning plate mounted on the charging hopper; and

weighing means, mounted on the base, for weighing batches of articles in the hoppers, selecting a combination of batches of articles having a total weight closest to a target weight, discharging the selected combination of batches of articles from the hoppers, and collecting the batches of articles discharged from the hoppers.

4,534,430

COMBINATION WEIGHING MACHINES AND METHOD

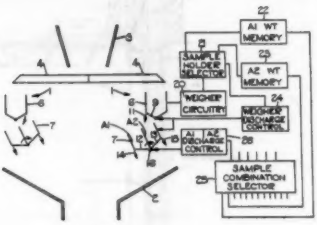
Henry J. Steel, Malvern, England

Filed Dec. 19, 1983, Ser. No. 562,514

Claims priority, application United Kingdom, Dec. 17, 1982, 8236007

Int. Cl.³ G01G *13/22, 19/22, 19/52*

U.S. Cl. 177—25 **20 Claims**



1. A combination weighing machine comprising feeder means for supplying feed material, a plurality of sample holders for holding respective samples of feed material supplied by the feeder means, one or more sample weighers for producing electrical output signals dependent on the weights of the samples supplied to the sample holders, memory means operatively associated with the weigher(s) for storing signals indicative of the weights of the samples in the sample holders as determined by the weigher(s), selection means connected to the memory means for making a selection from amongst the samples in the sample holders in dependence on the weights of the samples as indicated by the memory means and for discharging the selected samples from the sample holders to form a batch of a desired batch weight, and feedback control means for controlling supply of fresh feed material to the empty sample holders in dependence on the weights of the samples remaining in the sample holders as indicated by the memory means so as to supply fresh samples of target weights such as to compensate for overweight or underweight samples remaining in the sample holders.

4,534,431

SUPPORTING FEEDER ASSEMBLY FOR MATERIAL HANDLING MACHINES

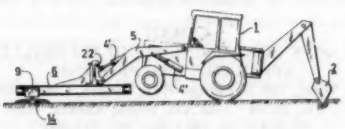
Bo Aronsson, Kyrkogatan 36, S-579 00 Högsby, Sweden

Filed Mar. 28, 1984, Ser. No. 594,132

Claims priority, application Sweden, Apr. 8, 1983, 8301962

Int. Cl.³ B62D *57/02*

U.S. Cl. 180—9 **10 Claims**



1. A supporting feeder assembly for material handling machines, said assembly being adapted to be detachably secured to said machine, wherein said assembly comprises

(a) one single elongate beam unit,

said unit being disposed substantially centrally in the longitudinal direction of the machine,

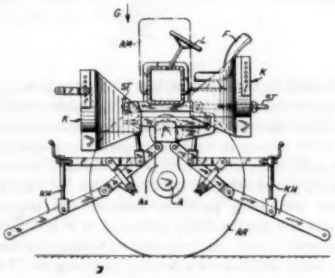
(b) a carraige,
said carriage being supported by said beam unit and being capable of running along the beam unit in the longitudinal direction thereof, and
(c) a carrier assembly,
said carrier assembly being connected to said carriage for engaging a substrate such as the ground.

4,534,432

MOTOR DRIVE UNIT FOR FORMING SELF-DRIVING AGRICULTURAL IMPLEMENTS OF VARIOUS STRUCTURES

Ernst Weichel, Postfach 1180, 7326 Heiningen, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 332,209
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1980, 3049055
Int. Cl.³ B62D *49/06*
U.S. Cl. 180—1 T **7 Claims**



1. A motor driven unit for forming differently structured, at least biaxial, self-driving agricultural transport implements and operating machines comprising a uniaxial and controllable motor basic unit having a front end and a rear end and a driving shaft extending transversely of the front end-rear end direction, and at least one special element attachable to one of the front and rear ends of said basic unit and having at least one further shaft, characterized in that the controllable motor basic unit (G) has similar couplings disposed mirror-image like on opposite sides of said driving shaft (A) and that said at least one special element having said at least one further shaft has a free terminal end (D) provided with a matching coupling countermember (K') engageable with one of said couplings, said controllable motor basic unit including a frame, a driving motor, a driver's seat and a steering wheel for said driving shaft.

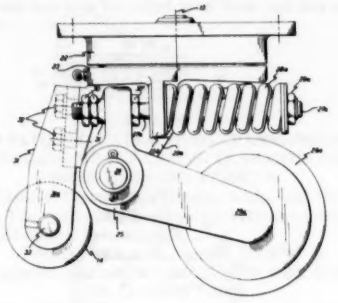
4,534,433

MATERIAL HANDLING VEHICLE

Charles H. Burbank, Geneseo, and Robert J. Lewis, Binghamton, both of N.Y., assignors to The Raymond Corporation, Greene, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,130
Int. Cl.³ B62D *51/04*
U.S. Cl. 180—19.1 **7 Claims**

1. In a lift truck having a pair of front non-steerable load wheels spaced laterally apart at equal distances on opposite sides of a centerline, a steerable rear drive wheel mounted on a first side of said centerline, and a caster wheel assembly mounted to swivel about a castering axis located on the opposite side of said centerline, said caster wheel assembly including resiliently mounted caster wheel means adapted to rotate about an axle axis displaced from said castering axis and normally to resiliently support a portion of the weight of said truck; the improvement which comprises an auxiliary wheel mounted on said caster wheel assembly to swivel with said caster wheel means about said castering axis, and mounted so



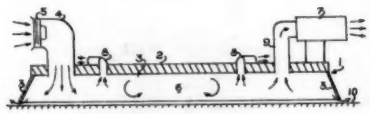
as not to engage the floor unless lateral tilting of the truck exceeds a predetermined amount.

4,534,434

PROPULSION PLANT FOR AIR-CUSHIONED VEHICLES

William B. Stocking, 981 Manzanita St., Chula Vista, Calif. 92011

Filed Jun. 2, 1983, Ser. No. 500,557
Int. Cl.³ B60V *1/15*
U.S. Cl. 180—120 **5 Claims**



1. A power plant for supporting a vehicle over a volume of pressurized air and for propelling said vehicle over a generally flat surface, which comprises:
means for creating said volume of pressurized air under the floor of said vehicle;
an air-fed engine dimensioned and oriented to displace said vehicle along said surface, said engine having an air intake; and
means for feeding a portion of said pressurized air into the air intake of said engine, said portion of pressurized air essentially providing all the air used to feed said engine.

4,534,435

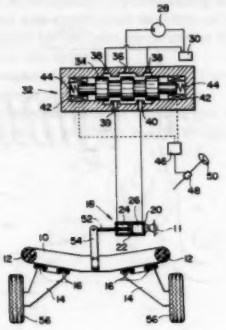
COMPLIANCE STEER CONTROL ARRANGEMENT FOR AUTOMOTIVE VEHICLE SUSPENSION

Yasuji Shibahata; Namio Irie, both of Yokohama; Kazuo Ikawa, Tokorozawa, and Yohsuke Akatsu, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 6, 1983, Ser. No. 501,091
Claims priority, application Japan, Jun. 7, 1982, 57-97366
Int. Cl.³ B62D *5/06, 9/00*
U.S. Cl. 180—140 **6 Claims**

1. In a suspension arrangement for a vehicle having a chassis and a steering wheel,
an elastomeric member;
a first member operatively connected to said chassis through said elastomeric member;
a road wheel operatively connected with said first member; and
an arrangement responsive to said vehicle being steered which is operatively connected to said first member for

applying a bias to said elastomeric member in a manner to change the orientation of said road wheel with respect to the longitudinal axis of said chassis and steer the road wheel in the same direction as the vehicle is being steered.

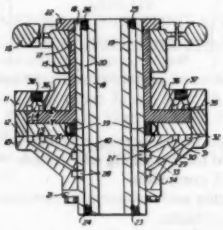


4,534,436

CONTROL VALVE APPARATUS AND STEERING SYSTEMS

Clement O. DuFrene, Cottage Grove, Minn., assignor to Gordon Rosenmeier, Little Falls, Minn., a part interest

Filed Aug. 25, 1983, Ser. No. 526,340
Int. Cl.³ B62D *5/08;* F15B *9/10*
U.S. Cl. 180—144 **20 Claims**



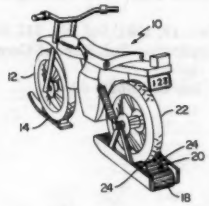
1. A control valve apparatus for fluid systems, comprising a housing having base passage means for source fluid opening at a first valve-facing surface within said housing and action passage means for work-performing fluid opening at a second valve-facing surface within said housing, said first and second valve-facing surfaces being in opposing spaced apart relationship, an adjustable valve assembly within said housing at a location between said first and second valve-facing surfaces, said valve assembly comprising a pair of interfaced valve members individually rotatable about a common axis and normally in a neutral relationship in which no through passages are formed between said base passage means and said action passage means, one said valve member being a driver member and the other a follower member, means for effecting rotation of said driver member independently of said follower member to thereby alter said neutral relationship and form fluid passage means through said valve assembly for fluid passage between said base passage means and said action passage means, and reactive damming means within said valve assembly and including metering passage means therefor distinct from said fluid passage means of said valve assembly, said reactive damming means being fed through said metering passage means by a metered portion of the fluid that passes through said fluid passage means of said valve assembly to thereby effect subsequent followup rotation by said follower member and reform said neutral relationship after termination of said driver member rotation.

4,534,437

SNOW TRACK BELT FOR MOTORCYCLE

Anderson W. Howerton, Christian County, and James A. Lewis, Springfield, both of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Sep. 9, 1983, Ser. No. 530,818
Int. Cl.³ B62M *27/02*
U.S. Cl. 180—185 **20 Claims**



1. In an endless flat-type traction belt for a driving attachment for motorcycles having a main body made of an abrasion resistant, high tear strength elastomeric material and being adapted to be moved in an endless path along a longitudinal axis, said main body comprising a substantially smooth inner surface and a ground engaging outer surface having a plurality of traction increasing portions thereon, the improvement wherein said belt has flexibility sufficient to at least flex over a 2 inch diameter roller, said traction increasing portions comprise deep teeth which have a depth comprising 60–75% of the total belt thickness, said traction increasing portions being adapted for acting as a sprocket engaging means for driving said belt, said deep teeth having a substantially uniform tooth pitch, and said belt having a smooth thin flexible inner surface.

4,534,438

MOTORIZED VEHICLES

Donald J. Mowat, and H. Michael Doman, both of Kitchener, Canada, assignors to Midon Engineered Products, Inc., Kitchener, Canada

Division of Ser. No. 250,140, Apr. 3, 1981, Pat. No. 4,452,327. This application Apr. 16, 1984, Ser. No. 600,356
Claims priority, application Canada, Nov. 6, 1980, 364194
Int. Cl.³ B60B *35/10;* B60T *1/04;* B62K *5/06*
U.S. Cl. 180—209 **1 Claim**

1. A telescopic axle assembly for use on a vehicle, comprising, when viewed in plan:

a V-shaped axle housing, the arms of said V extending towards the rearmost corners of the vvehicle;

an axle member having a vehicle supporting wheel rotatably affixed to the outer end thereof slidably adjustable within

each of said arms forming said housing, said axle member being adjustable within said arm between a fully retracted and a fully extended position to simultaneously vary the wheel base and the track of said vehicle, wherein each of said axle members includes a plurality of pairs of axially aligned holes formed therein and each arm of said axle housing has axially aligned apertures formed therein, said pairs of holes being alignable with said apertures to receive a retractable pin member therethrough for fixing the position of said axle member within said arm; and

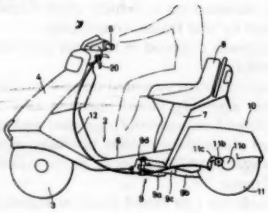
brake means affixed to at least one of said axle members adjacent an inner surface of said vehicle supporting wheel such that said brake means move with adjustments to the position of said axle member to remain adjacent said wheel, said brake means being adapted to permit the rotation of said vehicle supporting wheel and comprising brake mounting means provided adjacent said wheel, a cam member pivotally supported by said mounting means, said cam member being actuatable between a wheel braking and a wheel releasing position and resilient means disposed between said cam member and said wheel such that in the braking position of said cam member, said cam member urges said resilient means into frictional engagement with said wheel.

4,534,439

PARKING LOCK DEVICE FOR MOTOR TRICYCLES

Taiichi Shimazaki, and Masahico Takenaka, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 411,078
Claims priority, application Japan, Aug. 27, 1981, 56-134498
Int. Cl.³ B62D *61/08*; B62L *3/02*
U.S. Cl. 180—215 **7 Claims**



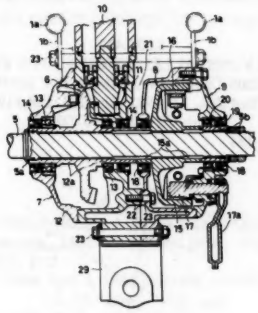
6. A parking lock device for an engine powered, small-sized vehicle, having brake lock means (**11***a*, **11***b*, **11***c*) for braking movement of said vehicle (**1**), and key switch means (**36**) for starting and stopping an engine powering said vehicle, said parking lock device comprising parking operation lever means for actuating at least said brake lock means when in a parking position, said key switch means includes a lock position mode (c) where a key is allowed to be inserted into or pulled apart from said key switch means, and an engagement member (**38**) which is operative in said lock position mode to cooperate with said parking operation lever means to hold said operation lever means in the parking position while allowing insertion or withdrawal of said key; wherein said operation lever means including an operation lever (**20**), a bracket (**15,17**) fixed to a steering handle of said vehicle, a rotary shaft (**19**) which is rotatably supported relative to said bracket and one end of which is fixed to said operation lever, a lock plate (**21**) fixed to the other end of said rotary shaft, and an arm (**24**) fixed to a middle portion of said rotary shaft, and means (**30, 33, 12**) for actuating said brake lock means (**11***a*, **11***b*, **11***c*), said actuating means being controllable to selectively actuate said brake lock means in response to movement of said arm (**24**), said engagement member (**38**) being biased toward said lock plate (**21**), wherein when said operation lever (**20**) is rotated in one direction said actuating means (**30, 33, 12**) is operative to actuate said brake means (**11***a*, **11***b*, **11***c*) while at the same time, said lock plate is rotated to thereby move said engagement member (**38**) from its retracted position to its extended position allowing said key switch means to be positioned in its lock mode, whereby said key may be pulled apart from said key switch means (**36**).

4,534,440

APPARATUS FOR ATTACHING TRANSMISSION CASING AND BRAKE CASING IN MOTORIZED THREE-WHEELED VEHICLE

Satoshi Sekizaki, Toyama; Eiji Hosoya, Asaka, and Hotoyuki Takasu, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,674
Claims priority, application Japan, Nov. 10, 1982, 57-196086
Int. Cl.³ B62K *5/04*
U.S. Cl. 180—215 **4 Claims**



1. An apparatus for attaching a transmission casing and a brake casing in a motorized three-wheeled vehicle having a rear wheel axle interconnecting between a pair of right and left rear wheels, a transmission casing housing a final stage driving mechanism, a brake casing housing a brake mechanism provided around the axis of the axle, characterized in that the transmission casing and the brake casing are composed of respective sealed casings, the two casings are disposed side by side leaving a space therebetween, and are combined together at circumferentially arranged plural positions with plural fastening bolts said two casings being connected to said vehicle and supporting said axle.

4,534,441

SEAT BELT RETRACTOR

Ken Kamijo, Zushi, and Yasuyuki Uekusa, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Mar. 15, 1984, Ser. No. 589,751
Claims priority, application Japan, Apr. 14, 1983, 58-66160
Int. Cl.³ B60R *21/10*
U.S. Cl. 180—268 **5 Claims**

1. A seat belt retractor comprising:

a housing;

a take-up shaft rotatably mounted to said housing;

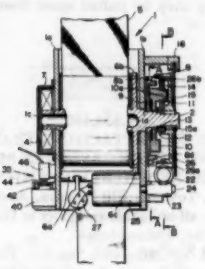
a spring means for biasing said take-up shaft in a belt retracting direction of retracting a seat belt;

a gear mechanism operatively coupled to said take-up shaft;

a tensionless mechanism operatively coupled to said gear mechanism and operable to prevent said take-up shaft from rotating in said belt retracting direction;

a motor actuated slack control mechanism operatively cou-

pled to said gear mechanism and operable to rotate said take-up shaft; and



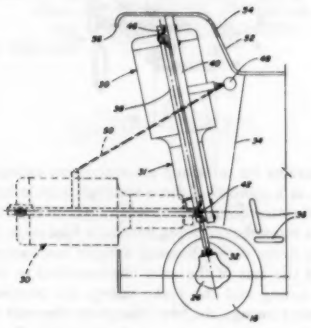
means for controlling operation of said tensionless mechanism and said motor actuated slack control mechanism.

4,534,442

VERTICALLY INSTALLED ENGINE LOW FLOOR BUS

Bela Botar, 10205 Collins Ave., Miami, Fla. 33154

Filed Jun. 14, 1982, Ser. No. 388,119
Int. Cl.³ C04B *43/00*
U.S. Cl. 180—294 **2 Claims**



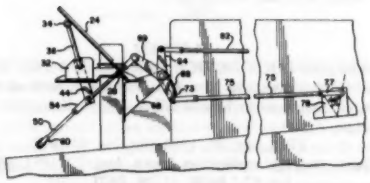
1. A vertically installed engine bus comprising a bus body having front steerable wheels and rear drive wheels interconnected by a drive axle assembly, a floor, and drive motor and transmission means connected to the drive axle assembly, said drive motor and transmission means being disposed vertically above and perpendicular to the drive axle assembly thereby enabling the drive axle assembly and rear wheels to be oriented closer to the rear of the body and increasing the wheelbase without increasing the overall length of the bus, said body having a rear wall providing an insulated partition between the rear of the floor and the compartment receiving the drive motor and transmission means, said floor being disposed in a single plane and extending forwardly from the rear axle assembly and locatable in a horizontal plane below the upper limit of movement of the drive axle assembly whereby the floor may be positioned closer to the ground surface, and a rearmost seat assembly affixed to the body forwardly of the rear wall in a manner eliminating access to the drive motor and transmission means compartment through the rear wall, said drive motor and transmission means being supported from a sub-frame, means pivotally supporting the lower end of the sub-frame from the body to enable the drive motor and transmission means to pivot about an axis transverse to the body to a generally horizontal position extending longitudinally of the body for easy access to all areas of the drive motor and transmission means, said body having air intake means adjacent the upper surface thereof to enable clean cooling air to be circulated downwardly over the drive motor and transmission means for discharge at the lower end to eliminate entrainment of dust and dirt into the cooling air as occurs when the air intake means is at the rear lower portion of the bus, said sub-frame being retained in upwardly extending position by removable fastener means adjacent the upper end thereof, winch means for raising and lowering the sub-frame, drive motor and transmission means about the transverse axis defined by the pivotal support means, said pivotal support means including rubber cushioned stub shafts.

4,534,443

FOLDABLE THROTTLE CONTROL LINKAGE FOR A TILTABLE TRUCK CAB

Stanley A. Hurst, Plainfield, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Nov. 9, 1983, Ser. No. 550,154
Int. Cl.³ B60K *19/02*
U.S. Cl. 180—328 **10 Claims**



1. A motion transmitting linkage system interconnecting an engine means mounted on a vehicle rigid frame and a cab pivotally carried by said frame, comprising:

first control means disposed in said cab and moveable relatively thereof;

a second control means mounted on said engine means;

a folding rod assembly interconnecting said first control means with said second control means and comprising a plurality of chain-like elements pivotally interlinked and guiding movement of said second means when said assembly is collapsed;

said cab tiltable into its raised position together with said first control means from a lowered engine-enclosing position;

said rod assembly being able to automatically and continually fold away or fold down by a body translation between its collapsed position corresponding to said cab lowered position and a fold-out position correlated to said raised position;

said rod assembly preventing an oscillation of said cab and said engine in unison, while maintaining a positive communication between said first and second control means, in said cab lowered position.

4,534,444

INSULATED BOOM STRUCTURE FOR TELESCOPING AERIAL LIFT

Van Z. Smith, Waco, Tex., assignor to Time Manufacturing Company, Waco, Tex.

Continuation of Ser. No. 526,978, Aug. 29, 1983, abandoned.
This application Aug. 20, 1984, Ser. No. 642,158
Int. Cl.³ B66F *11/04*
U.S. Cl. 182—2 **6 Claims**

1. Improved telescoping boom structure for an aerial lift of the personnel carrying type comprising:

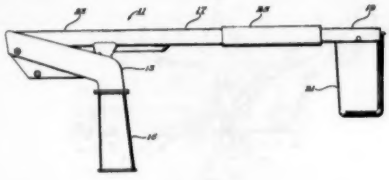
a. a lower boom section,

b. an upper boom section supported by said lower boom section for telescoping movement within said lower boom section, with said upper boom section being made of an

electric insulating material and adapted for mounting a personnel carrier bucket at its outer end portion;

c. means for powering said upper boom for extending and retracting movement;

d. said lower boom section having a main portion made of metal and having an electrically conductive upper extremity and an outer end portion made of electric insulating material,



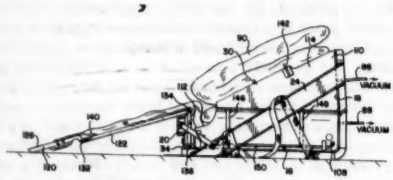
with said outer end portion, when said upper boom section is fully retracted, extending beyond said electrically conductive upper extremity for a distance sufficient to insure that a person occupying the bucket could not reach the metal portion of the lower boom section and that safe leakage current levels will not be exceeded in the presence of high voltage.

4,534,445

AIRCRAFT SLIDE PACKING FIXTURE

John M. Fisher, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 14, 1984, Ser. No. 609,617
Int. Cl.³ B64D *25/14*
U.S. Cl. 182—48 **5 Claims**



1. A packboard fixture device for assisting in the positioning of a deflated pneumatic slide into a rigid packboard locatable in the packboard fixture device, the device including a cradle having a base plate, a long upstanding end wall and a short upstanding end wall pivotal with respect to the base plate, a separate pressure block mountable over the device on the side opposite the base plate between the end walls and further including strap means for applying pressure to the pressure block for movement toward the base plate to uniformly compress a deflated pneumatic slide into the packboard.

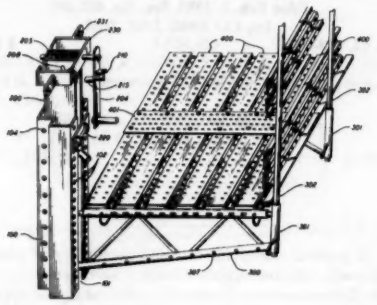
4,534,446

SYSTEM OF MOVABLE FOOTBRIDGES FOR THEIR USE IN THE CONSTRUCTION

Salvador Pujol-Barcons, Antonio Duenez Orozco 170, Cuidad Industrial, Terreon, Coah., Mexico

Filed Dec. 20, 1983, Ser. No. 563,667
Int. Cl.³ E04G *3/14*
U.S. Cl. 182—146 **9 Claims**

1. A walkway system which comprises perforated rails which may be fixed directed or indirectly to a structure wherein said rails comprise a substantially hollow profile with an opening along one side, said perforations in the rail being disposed at regular intervals on either side of said opening and a walkway wherein said walkway comprises a sliding element, the major part of which is disposed within said hollow profile, there being mounted on said profile escalator wheels having projections thereon which are cooperable with the perforations in the rail, said wheels being rotatable by a manually operable handle extending through the opening in the rails.

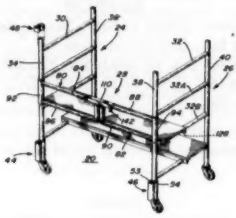


4,534,447

FOLDABLE LADDER SCAFFOLD

Lucien Champigny, 1420 St. Elzéar Blvd., West Chomedey, Canada H7L 3N2

Filed Apr. 3, 1984, Ser. No. 596,501
Int. Cl.³ E04G *1/34, 1/20*
U.S. Cl. 182—152 **3 Claims**



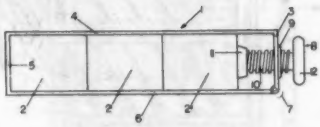
1. A foldable scaffold comprising two end ladders, each including a fore and an aft leg and a number of step rods extending between said fore and aft legs, a truss pivotally connected to said aft ladder legs at an intermediate portion of the latter, said truss being made of two sections and including hinge means interconnecting said sections for pivotal forward movement of said truss sections for a fully-extended truss position in which said sections are in end-to-end alignment to a folded truss position, said forward movement of said truss sections producing relative lateral movement of said end ladders from spaced-apart positions one toward the other to contiguous positions, and hinge means locking means to releasably fixedly imomobilize said truss sections in said fully-extended truss position, each truss section consisting of a rigid rectangular member comprising upper and lower horizontal parts interconnected by a vertical outer sleeve and a vertical inner rod, said sleeve rotatably surrounding said aft leg between two step rods of one said ladder, and said hinge means consisting of a double tube rotatably surrounding the adjacent vertical inner rods of the two rectangular members.

4,534,448

SCAFFOLD CLAMP

Peter C. Trainer, 4 Dogwood La., Easton, Conn. 06612

Filed Feb. 2, 1983, Ser. No. 463,294
Int. Cl.³ E04G *5/08, 7/28*
U.S. Cl. 403—396 6 Claims



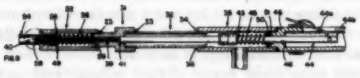
1. A scaffold clamp for securing a plurality of planks in side-by-side relationship comprising a rectangular enclosure means dimensioned to circumscribe said planks, said enclosure means comprising first and second rigid bars in parallel relationship, one pair of adjacent ends of said bars being joined through an essentially perpendicular butt member relatively shorter in length than said bars, the opposite end of said first bar being angled inwardly to form an essentially perpendicular working plate terminating in a locking means for attachment with the adjacent end of said second bar, said enclosure means bearing a press screw extending longitudinally through said plate for exerting pressure against the edges of planks enclosed by said clamp.

4,534,449

PERFORATING, SEAL-GREASING APPARATUS AND METHOD

Eldon E. Larson, Kitsap County, Wash., assignor to Eltech Innovations Inc., Bremerton, Wash.

Filed Sep. 14, 1983, Ser. No. 532,016
Int. Cl.³ F16N *21/04, 5/02;* G01R *31/22;* A61M *5/32*
U.S. Cl. 184—105.2 9 Claims



9. A method of perforating and lubricating sealed joints made of a material that is self-sealing if perforated by a small hole, comprising:

piercing said seal with a needle to create a small self-closing hole;

withdrawing said needle and inserting grease under pressure through said hole into said seal; and

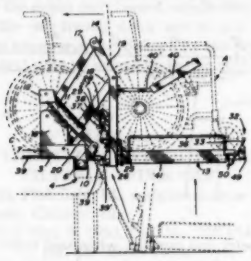
releasing said pressure to stop the flow of grease and allowing said self-sealing material to seal said hole.

4,534,450

INVALID LIFT

Pierre Savaria, 199 St. Joseph St., Oka, Canada J0N 1E0

Filed Apr. 30, 1984, Ser. No. 605,222
Int. Cl.³ B66B *9/20*
U.S. Cl. 187—9 R 7 Claims



1. A lift assembly for use in association with a vehicle having a door opening and a floor, said assembly comprising an anchoring plate means fixedly secured to said floor inwardly of said door opening and a platform rotatable relative to said anchoring plate means between an upstanding stored position inside the vehicle and an outside intermediate position level and parallel with the vehicle floor at said door opening, and movable from that position to a lower position at ground level and inversely, said platform including a platform frame, and two independent platform sections pivotally secured to said platform frame respectively, said platform sections being rotatable between a position where they lie in the same plane to form a flat surface and a transverse opened position to allow a non-invalid person to use the vehicle door when said platform is in stored position, a pair of armatures, swingable in parallel paths normal to and at each side of said platform, connected to the latter and pivotally connected to said anchoring plate means, said armatures each consisting of a deformable parallelogram system including upper and lower superposed parallel members and a substantially vertical member which is pivotally connected at its upper end to said parallel members and to said platform at its lower end and which extends at a lower level than said superposed members when said platform is at said lower position, bi-directional motor means carried by said anchoring plate means and connected to said armatures to swing the latter and a pair of articulated members rotating said platform between said intermediate position and said upstanding stored position when said armatures are moving toward the interior of the vehicle, said articulated members each comprising an upper link and a lower link secured together in rotative relationship, said upper link being pivotally secured to said vertical member of said armatures and pivoting when abutting with the lower parallel member of said armature, the rotation of said upper link displacing the lower link which is pivotally connected to said platform frame.

4,534,451

INCLINED ELEVATOR WITH SINGLE RAIL

Karl Peter, Vorarlberg, Austria, assignor to ROMEX Aktiengesellschaft, Bendern, Liechtenstein

Filed May 24, 1983, Ser. No. 497,762
Claims priority, application Austria, May 26, 1982, 2066/82
Int. Cl.³ B66B *9/06*
U.S. Cl. 187—12 5 Claims

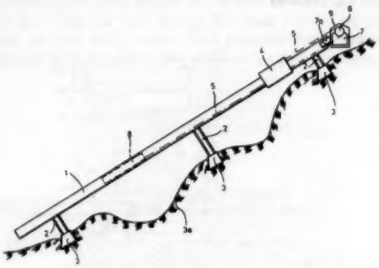
2. An elevator comprising:

a single rail inclined between a low location and a high location and formed as a closed polygonal profile tube having a diagonal disposed vertically and a pair of downwardly and outwardly inclined surfaces joined at an apex of said rail;

a vehicle displaceable on said rail between said locations above said surfaces;

a chain affixed to said vehicle, passing around a sprocket at said upper location and extending downwardly into the through said tube;

a counterweight on a lower end of said chain in said tube,



said counterweight having a bevel on a lower end thereof; and

a body of liquid in at least a lower portion of said tube whereby said bevel upon said counterweight encountering said body of liquid causes the counterweight to be pressed against walls of said tube to brake descent of said counterweight.

4,534,452

HYDRAULIC ELEVATOR

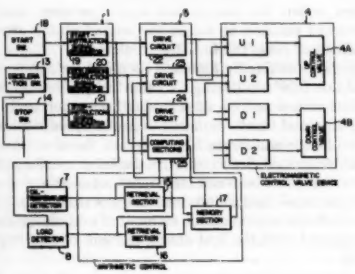
Tsuyoshi Ogasawara; Ken Ichiryu, both of Ibaraki; Ichiro Nakamura, and Yasuo Kido, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,651

Claims priority, application Japan, May 6, 1983, 58-78261

Int. Cl.³ B66B *1/04*

U.S. Cl. 187—29 A **4 Claims**



1. In a hydraulic elevator system in which a cage is moved by hydraulic means including a cylinder and a plunger, a control apparatus comprising:

instruction means for producing a cage deceleration instruction in response to the cage reaching a predetermined deceleration position in advance of a stop position where the cage is to be stopped;

memory means for storing a plurality of values of deceleration delay time as a function of the termperature of the oil used for driving the hydraulic means and the load of the elevator;

data retrieval means connected to said memory means for retrieving one of said plurality of values corresponding to detected values of the oil temperature and elevator load; and

drive means responsive to said deceleration instruction for causing said cage to begin to decelerate after expiration of a delay time corresponding to the value retrieved by said data retrieval means following the producing of said deceleration instruction by said instruction means.

4,534,453

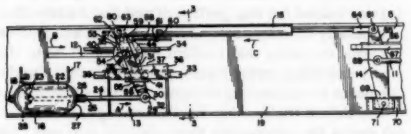
BRAKE LEVER ASSEMBLY FOR RAILWAY CAR

Donald B. Yates, Homewood, Ill., assignor to Pullman Standard, Inc., Chicago, Ill.

Filed Oct. 17, 1983, Ser. No. 542,721

Int. Cl.³ B61H *13/20, 13/38*

U.S. Cl. 188—52 **13 Claims**



1. In a railway car having a longitudinally extending draft structure and a brake system, said brake system having a first brake rod for connection to a first brake means at a first wheel truck and a second brake rod for connection to a second brake means at a second wheel truck and a braking linear force imposer having a nonextended, nonbraking position and an extended braking position, an improved brake lever assembly comprising:

a brake lever mounted in a substantially vertically extending position, said brake lever having a first end portion pivotally connected to said linear force imposer, a second end portion pivotally connected to one of said first and said second brake rods and an intermediate portion pivotally connected to said other of said first and said second brake rods;

guide means for enabling said brake lever to move substantially parallel to said draft structure;

brake lever support means pivotally engaged with a portion of said brake lever intermediate said first and said second end portions of said brake lever; and

biasing means for urging said brake lever support means in a direction for urging said first and said second brake means out of braking contact with said respective first and second wheel trucks and for urging said linear force imposer to said nonextended, nonbraking position for eliminating brake drag of said brake means on said wheel trucks.

4,534,454

COMBINATION CLUTCH-BRAKE

Edward D. Brooks, Fridley, Minn., assignor to Horton Manufacturing Co., Inc., Minneapolis, Minn.

Filed Nov. 30, 1981, Ser. No. 325,857

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—18 A **18 Claims**

1. A combination clutch-brake comprising, in combination:

(a) a housing,

(b) an output shaft,

(c) means rotatably mounting said output shaft in said housing,

(d) a first firstion disc including a first radially extending, flat ring portion connected to a spaced second radially extending, flat ring portion in a parallel relation by spaced webs and having a first friction lining on the face of the first flat ring portion and

(e) a first hub connected thereto,

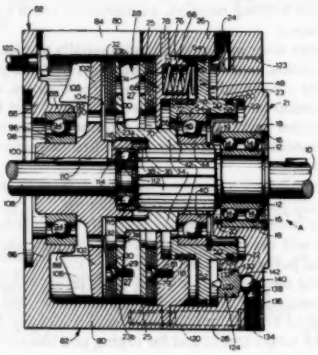
(f) means mounting said hub slideable on said output shaft and rotatable therewith,

(g) a single annular piston,

(h) means forming an annular cylinder in said housing in conjunction with said piston,

(i) means slideably mounting said piston in said cylinder,

(j) means mounting said piston on said first hub for axial movement therewith and for rotation of said hub and output shaft relative to said piston,
(k) resilient means comprising a pluraity of coil springs,
(l) said means slideably mounting said piston including means for mounting said resilient mens comprising a spring housing fixed in said housing adjacent said piston having a plurality of axially extending recesses for receiving said coil springs for normally urging said piston and said first hub in one axial direction to space said first friction lining on said first friction disc from
(m) a driven friction disc mounted on
(n) a second hub rotatable within said housing and to engage.
(o) said second flat ring portion of said first friction disc with a radially extending second friction lining mounted on said means mounting said resilient means opposite to the axially extending spring recesses to thereby brake said shaft,
(p) means for connecting an input shaft to said second hub of said driven friction disc for the driving thereof, and
(q) means for introducing fluid pressure into said cylinder and upon said piston for movement of said first friction



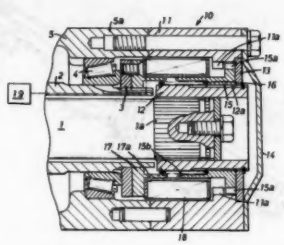
disc from said second lining on said means mounting said resilient means against the action of said resilient means and into engagement with said driven friction disc to thereby clutch in and rotate said output shaft; wherein the piston comprises, in combination: an axially disposed annular flange portion having a first end and a second end; an annular portion having a first end and a second, free end, with the first end of the annular portion being connected to the annular flange portion with the annular portion extending radially outward from the annular flange portion between its first and second ends; and wherein the means slideably mounting said piston includes a radially extending body portion formed in the housing having a right angular annular flange and a right angular projection, with the free end of the annular portion of the piston abutting with and for reciprocal movement on the right angular annular flange of the body portion and the axially disposed annular flange of the piston being slideable adjacent its first end on the right angular projection of the second member; and wherein the annular flange portion of the piston is slideable adjacent its second end on the spring housing.

4,534,455

WHEEL HUB CLUTCH ASSEMBLY

Motoi Fujikawa, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 19, 1983, Ser. No. 524,668
Claims priority, application Japan, Aug. 26, 1982, 57-148317
Int. Cl.³ F16D *27/09*
U.S. Cl. 192—40 **4 Claims**



1. An electrically operated wheel hub clutch assembly for automotive vehicles having a driveable axle rotatable in a stationary axle tube, a wheel hub of magnetic material rotatable on said axle tube, and an electric control circuit to produce an electric control signal therefrom when said axle is subjected to rotation under power, the wheel hub clutch assembly comprising:

a cylindrical body of magnetic material integrally formed therein with a first clutch element and to be fastened to the outer end of said wheel hub;

an inner sleeve member of non-magnetic material fixedly mounted on the outer end of said axle and located within said cylindrical body;

a cylindrical clutch member of magnetic material integrally formed with a second clutch element to be engaged with the first clutch element of said body and axially slidably mounted on said inner sleeve member for rotation therewith;

resilient means for biasing said clutch member toward an unlocked position in which the second clutch element is disengaged from the first clutch element;

an annular core fixedly mounted on the outer end portion of said axle tube and having a cylindrical portion opposed to the inner end portion of said clutch member; and

a magnetic coil fixedly coupled over the cylindrical portion of said core and being responsive to the electric control signal from said electric control circuit to produce an axial attraction force between said clutch member and said core so as to move said clutch member toward a lock position in which the second clutch element of said clutch member is engaged with the first clutch element of said body.

4,534,456

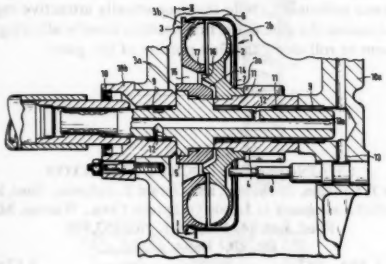
HYDRODYNAMIC POWER TRANSMISSION UNIT

Paul J. Slezak, Pierrefonds, Canada, assignor to KHD Canada, Inc., Montreal, Canada

Filed Aug. 30, 1982, Ser. No. 413,153
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1982, 3212505
Int. Cl.³ F16D *33/16, 33/20*
U.S. Cl. 192—58 A **9 Claims**

1. A hydrodynamic power transmission unit which comprises a housing; a hollow drive shaft which is mounted in the housing for rotation; a driven shaft which extends into the housing and is mounted on mounting bearings so as to be rotatable with respect thereto, said driven shaft extending through and being concentric with said drive shaft so as to provide an annular space therebetween; a number of cylindrical bearings positioned in said annular space between said drive shaft and said driven shaft; an impeller disc which is

connected to said drive shaft to extend radially outwardly therefrom, said impeller disc including a base portion and a head portion, said head portion of said impeller disc having a cup-shaped cross section and blades therein; and a turbine disc which is connected to said driven shaft to extend radially outwardly therefrom, said turbine disc including a base portion and a head portion, said head portion of said turbine disc having a cup-shaped cross section and blades therein; the head portion of said impeller disc facing the head portion of said turbine disc so that, with a drive fluid therebetween, rotation of the impeller disc by said drive shaft will cause rotation of



said turbine disc and thus said driven shaft; the base portion of said turbine disc defining an annular recess which faces the base portion of said impeller disc, the base portion of said impeller disc including an annular rib which extends into the annular recess in the base portion of said turbine disc, and the facing sides of the base portions of said turbine and impeller discs being shaped to provide at least one flow passage which extends from said annular space to said annular recess at a point radially inwardly of said annular rib, each flow passage functioning to remove pressurized lubricating oil, which has lubricated said cylindrical bearings and said mounting bearings, from said annular space without mixing with said drive fluid.

4,534,457

MULTI-DISC CLUTCH OR BRAKE WITH A RESILIENT CLAMPING MEANS INSERTABLE BETWEEN A LAMELLA AND THE ASSOCIATED LAMELLA CARRIER

Georg Eltze, Stuttgart; Klaus Lüttge, Fellbach; Jürgen Pickard, Wernau; Hans Rübmann, and Helmut Sandner, both of Neuhausen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

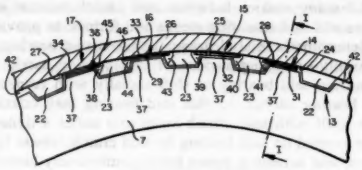
Filed Jan. 17, 1984, Ser. No. 571,430

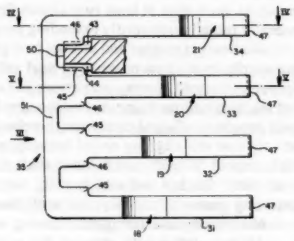
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1983, 3302430

Int. Cl.³ F16D *13/52, 3/12*

U.S. Cl. 192—70.2 **20 Claims**

1. A multi-disc clutch or brake, comprising several lamellae in the form of annular discs operable to be essentially non-rotatably fixed, relative to a lamella carrier which is fixed in terms of rotation in relation to one of two clutch or brake parts, by means of a releasable positive connection, and in which each disc is radially supported on the lamella carrier exclusively at an individual point by means of its own resilient clamping means having an engagement surface, the clamping means being retained on the lamella carrier, at least one annular gap being provided which is located, in the peripheral directions of the axis of rotation, between two engaging teeth of the positive connection and is open in the two directions of the axis of rotation, said gap being limited radially in one direction by a cylindrical shell portion of a lamella and in the other direction by a cylindrical shell portion of the lamella carrier, the engagement surface of the clamping means, which is operable as support, being located in the annular gap and cooperates with the shell portion of the lamella, and a comb-shaped holder means having several legs, two clamping means for two lamellae succeeding one another in the directions of the axis of rotation being arranged on different legs of the holder means,





and each leg of the holder means being operable to be inserted into a separate annular gap.

4,534,458

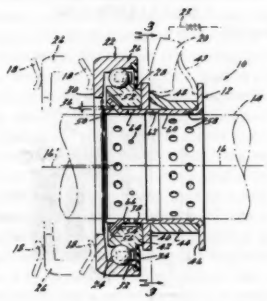
SELF-ALIGNING CLUTCH RELEASE BEARING ASSEMBLY

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Jan. 25, 1982, Ser. No. 342,255

Int. Cl.³ F16D *23/14*

U.S. Cl. 192—98 **3 Claims**



1. An improved self-aligning clutch release bearing assembly for a friction clutch in a vehicle power train having clutch release lever means rotatable about an input shaft axis of said clutch, a guide member disposed generally coaxially around a transmission shaft axis of said power train, and having an actuating means, said assembly comprising:

a tubular bearing carrier slidably mounted on said guide member for reciprocable, translational movement therealong in response to actuation of said actuating means, at least a portion of said bearing carrier being disposed radially between said guide member and said actuating means;

a bearing including a plurality of anti-friction elements interposed between radially spaced inner and outer race mem-

bers, one of said race members being adapted for rotation and having an annular radially extending bearing surface for engaging said clutch release lever means;

said bearing being disposed substantially coaxially around said bearing carrier between said clutch release lever means and said actuating means and formed to provide a predetermined radial clearance between said bearing and an axially extending surface of said bearing carrier for permitting said bearing to shift radially with respect to said bearing carrier, so that said bearing may coaxially align itself with said clutch input axis under a dynamic force exerted on said bearing by said clutch release lever means, said actuating means being continuously biased to urge said bearing axially toward said clutch release lever means and to hold said bearing surface in constant engagement with said clutch release lever means; and

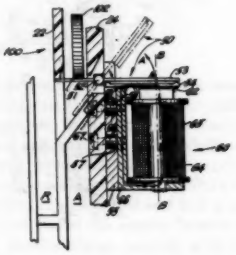
anti-rotation means, including at least two circumferentially spaced generally radially outwardly extending projections provided on said bearing carrier and at least two generally radially outwardly extending notches in said other race member for receiving said bearing carrier projections, said notches and said projections being dimensioned relative to each other to provide sufficient clearance therebetween to allow relatively free self-aligning radial movement of said bearing with respect to said clutch input shaft axis, said other race member notches and said bearing carrier projections extending generally radially outwardly to cooperate in a circumferentially interfering relationship with one another in order to substantially prevent the rotation of said other race member with respect to said bearing carrier, said notches and said projections also extending generally radially outwardly to cooperate in an axially interfering relationship with one another in order to substantially restrict relative axial movement thereof and to substantially retain said bearing in an assembled relationship with said bearing carrier.

4,534,459

LOW POWER COIN ROUTING GATE APPARATUS

George A. Plesko, Graterford, Pa., assignor to Mars Incorporated, McLean, Va.

Filed Mar. 1, 1984, Ser. No. 585,252
Int. Cl.³ G07F 9/04
U.S. Cl. 194—1 D **9 Claims**



1. A coin routing gate for selectively routing coins including a lightest and a heaviest acceptable coin in a coin handling mechanism comprising

a gate member pivotally mounted in the proximity of a coin track along which coins roll edgewise, the gate member having first and second portions and a medial axis about which the gate member pivots between a first position wherein the first portion forms a part of the coin track and a second position wherein the coin track is interrupted, the second portion serving in the absence of a downward force on the first portion of the gate member exceeding a predetermined force to counterbalance the gate into the first position, the second portion including a magnetically attractable region,

a low power, selectively energizable, electromagnet having a pole face in close proximity to the magnetically attractable region when the gate is in the first position,

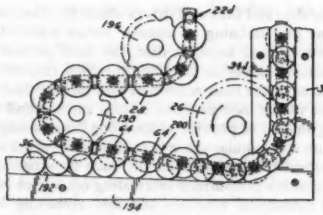
whereby when the electromagnet is not energized and the weight of a coin inserted in the coin handling mechanism produces a downward force on the first portion exceeding the predetermined force, the gate pivots into the second position to thereby prevent the coin from continuing along the coin track, and when the electromagnet is selectively energized, the electromagnet provides magnetic force sufficient to hold the magnetically attractive region to sustain the gate in the first position thereby allowing the coin to roll along the first portion of the gate.

4,534,460

CHAIN-DRIVEN POCKET ELEVATOR

James T. Graham, Rochester, and Gerald E. Johnson, Flint, both of Mich., assignors to Lamb Technicon Corp., Warren, Mich.

Filed Jan. 14, 1983, Ser. No. 457,970
Int. Cl.³ B65A 47/84
U.S. Cl. 198—482 **5 Claims**



1. A pocket elevator for workpieces of circular cross section comprising

an endless chain including means for driving said chain in a closed loop at uniform velocity in the direction of its length,

a plurality of spools fixedly mounted on said chain and uniformly spaced from each other lengthwise of said chain with spool axes perpendicular to said loop to define therebetween a plurality of identical pockets for receiving and capturing said workpiece,

each of said spools comprising a pair of discs separated by a spacer, each said pocket being defined by adjacent discs of successive spools and spacers of adjacent spools, separation between said spacers of adjacent spools being greater than the diameter of said workpieces circular cross section but less than twice said diameter,

a feed chute including a guide having a fixed continuous downwardly inclined sloping linear guide surface disposed to receive workpieces adjacent its upper end in a line on said surface with the axis of said circular cross section perpendicularly to said line such that said workpieces tend to roll downwardly along said surface by force of gravity, and

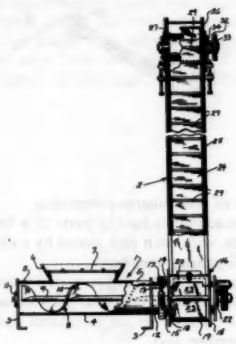
a pair of chain sprockets spaced apart lengthwise of said guide surface for directing said chain and pockets downwardly between said sprockets at an acute angle adjacent to and in the direction of slope of said surface such that said pockets successively engage said workpieces against said surface between said sprockets and capture successive ones of workpieces in successive corresponding ones of said pockets.

4,534,461

CONVEYOR CONSTRUCTION FOR CONVEYING MATERIALS TO AN ELEVATED LOCATION

Charles R. Silverthorn, Eureka, and Marcus N. Allhands, Gridley, both of Ill., assignors to A. O. Smith Harvestore Products, Inc., Arlington Heights, Ill.

Filed Aug. 18, 1982, Ser. No. 409,331
Int. Cl.³ B65G *21/10, 37/00*
U.S. Cl. 198—592 **4 Claims**



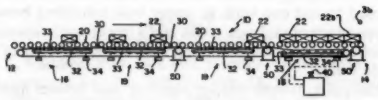
1. A conveyor construction, comprising a supporting structure, a horizontally oriented auger conveyor mounted on said supporting structure and having a feed end and a discharge end, said auger conveyor comprising an auger shaft and a spiral flight connected to said shaft, a second conveyor disposed at an angle to the horizontal and offset laterally from said auger conveyor, said second conveyor comprising a housing, an endless belt mounted for travel within said housing, said housing having an inlet opening disposed at one end and having a discharge outlet disposed at the opposite end, pivotal means for pivotally connecting said second conveyor to the discharge end of said auger conveyor for pivotal movement about the axis of said auger shaft, said pivotal means comprising a first annular fixed element secured to said auger conveyor and a second annular element secured to said housing and disposed to rotate relative to said first element, whereby said second conveyor can be pivoted relative to said auger conveyor from a substantially horizontal position to a vertical position, clamping means for clamping said two elements together to prevent rotation of said second conveyor relative to said auger conveyor, a plurality of cleats disposed in spaced relation on the belt, drive means for driving the belt, and a transfer member operably connected to said auger conveyor and disposed laterally of said inlet opening and disposed to propel said material laterally into said inlet opening, said housing having a longitudinally extending passage, said belt having a conveying run and a return run, said conveying run operating within said passage to elevate said material from the inlet opening to the discharge outlet, said housing of said second conveyor comprising a series of housing sections connected in end-to-end relation, each housing section comprising a pair of spaced side members and a pair of end members connecting the corresponding edges of the side members, a trough member spaced inwardly from one of said end members to define said longitudinally extending passage, the ends of the end members and trough members of each section being offset longitudinally from the corresponding ends of the side members of said section so that the joints between adjacent ends of the end members and trough members are staggered with respect to the joints between adjacent ends of the side members, each end member including a central section extending between the side members, a lip disposed on one end of each central section, said lip being planar with said central section, the lip on the end member of one housing section being disposed in lapping relation with the end of the central section of the end member of the next adjacent housing section, each trough member including a central web disposed parallel to the central sections of said end members and extending between said side members, a second lip disposed on one end of the central web of each trough member, said second lip being planar with said central web, the second lip of the trough member of one housing section being disposed in lapping relation with the central web of the trough member of the next adjacent housing section.

4,534,462

MOTION DETECTOR AND CONTROL SYSTEM FOR AN ACCUMULATING LIVE CONVEYOR

Alan A. Hoover, New Palestine, and Richard D. Harris, Fountaintown, both of Ind., assignors to Pentek Corporation, Indianapolis, Ind.

Continuation of Ser. No. 321,569, Nov. 16, 1981, Pat. No. 4,461,382. This application Apr. 12, 1984, Ser. No. 599,725
The portion of the term of this patent subsequent to Jul. 24, 2001, has been disclaimed.
Int. Cl.³ B65G *13/071*
U.S. Cl. 198—781 **14 Claims**

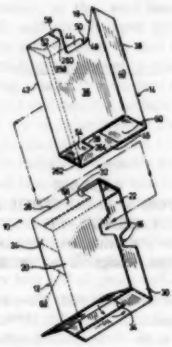


1. A system for controlling the operation of an accumulating live conveyor of the type inluding a plurality of load-carrying rollers supported for rotation about transverse axes, driving means for conveying loads over the load-carrying rollers from an upstream end toward a downstream end of the conveyor, and accumulating means for removing driving engagement of the driving means in selected areas of the conveyor to accumulate loads in such areas, the system comprising position detecting means for detecting a position of a load in a downstream area of the conveyor, first signal means responsive to the position detecting means producing a load position-related signal, means for actuating the accumulating means in response to the load position-related signal to remove driving engagement in the downstream area of the conveyor and stop the load at about the detected position on the load-carrying rollers, second signal means for sensing rotation of the load-carrying rollers beneath the detected position to detect an amount of rectilinear movement of the load on the load-carrying rollers and produce a load motion-related signal, the load motion-related signal including a periodic pulse, a series of periodic pulses corresponding to the rotation of the load-carrying roller and the amount of rectilinear movement of the load, signal processing means for processing the load motion-related signal and for producing a control signal for controlling the operation of the conveyor, the signal processing means including means for counting periodic pulses produced by the second signal means, the counting means including an output terminal initially at a first state, the output terminal being switched to a second state when the counting means has counted a predetermined number of periodic pulses whereby the control signal is produced in response to a predetermined amount of rectilinear movement of the load; and enabling means for enabling the signal processing means in response to the load position-related signal.

4,534,463
CIGARETTE CARTON

Claude Bouchard, St. Leonard, Canada, assignor to Ronalds-Federated Limited, Rolph-Clark-Stone Packaging Division, Mississauga, Canada

Filed Nov. 25, 1983, Ser. No. 554,894
Int. Cl.³ B65D 5/38
U.S. Cl. 206—267 6 Claims

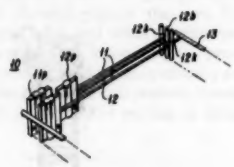


1. A container for cigarettes comprising:
a casing member having first and second side walls, an end wall extending between said side walls, an open end opposed to said end wall, an upper wall extending between upper ends of said side walls, and a lower wall opposed to said upper wall and extending between lower ends of said side walls,
a rectangular, tubular drawer member, said drawer member having first and second opposed side walls and first and second opposed end walls extending between said side walls,
an access slot defined between said second end wall and said side walls, adjacent said second end wall,
said casing member being adapted to slidably receive said drawer member through said open end, and said casing end wall adapted to engage said first end wall of said drawer member to limit inward sliding movement of said drawer member into said casing member,
a first shallow recess defined in said upper wall, extending from said casing member end wall and terminating in a first stop edge disposed inwardly of said open end,
a second shallow recess defined in said lower wall, extending from said casing member end wall and terminating in a second stop edge disposed inwardly of said open end,
a first drawer tab spaced from said drawer member second end wall, extending inwardly from an upper end of said draw member, said first drawer tab having a first tab leading edge, said first tab being slidably contained within said first shallow recess,
a second drawer tab spaced from said drawer member second end wall, extending inwardly from a lower end of said drawer member, said second drawer tab having a second tab leading edge, said second tab being slidably contained within said second recess, such that in a closed configuration of the container said first and second leading edges are spaced apart from said first and second stop edges respectively, and said access slot of said drawer member is concealed within said casing,
said first and second tabs being slidable within said first and second recesses respectively from said closed configuration to an open configuration in which said first and second leading edges engage said first and second stop edges, respectively, said drawer member projects out of said open end of said casing member and said access slot of said drawer member adjacent said second end wall is revealed.

4,534,464
MANUFACTURE AND USE OF CLOSELY SPACED ATTACHMENTS

Gordon B. Lankton, West Boylston, Mass., assignor to Nypro Inc., Clinton, Mass.

Filed Dec. 8, 1982, Ser. No. 448,030
Int. Cl.³ A44B 9/00; B65D 85/24; G09F 3/12
U.S. Cl. 206—343 17 Claims



1. An assembly of attachments comprising
a plurality of attachments having parts of a first type with enlarged faces, with each part joined by a elongated connector to a dispensing member;
a plurality of attachments having parts of a second type with enlarged faces, different than said parts of said first type, with each part joined by an elongated connector to a dispensing member; and
means for integrally connecting said attachments to one another by way of their dispensing members;
the attachments of said first type alternating with and immediately following those of said second type with their enlarged faces in different planes.

10. The method of manufacturing an assembly of attachments which comprises the steps of:
(a) molding a first attachment having a dispensing member with a connector extending to a further member at the opposite end of said connector;
(b) molding a second attachment which is shorter than said first attachment and having a further member which is engageable with said further member of said first attachment and being joined to said first attachment; and
(c) stretching said second attachment until its further member engages that of said first attachment.

15. The method of applying attachments to objects which comprises the steps of
(a) inserting a clip of attachments into a dispensing device, the clip including a first and second plurality of interleaved attachments selectively connected to a mounting element;
(b) advancing and dispensing a first said one of said attachments; and
(c) advancing and dispensing a succeeding one of said attachments; said advance of each first and succeeding attachments being made by contact of the advancing mechanism of said dispensing device with only a single position at every other attachment of said clip.

4,534,465
CASSETTE FOR SUPPORTING TEST TUBES OF DIFFERENT DIAMETERS AND/OR LENGTHS

William F. Rothermel, Hollywood; John P. Matthews, Pembroke Pines; James W. Walker, and Wallace H. Coulter, both of Miami Springs, all of Fla., assignors to Coulter Electronics Inc., Hialeah, Fla.

Filed Oct. 13, 1983, Ser. No. 541,602
Int. Cl.³ B65D 81/30
U.S. Cl. 206—443 13 Claims

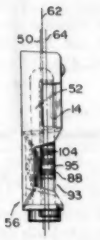
1. A cassette for supporting in a single row a plurality of liquid sample containers having upper side portions and different diameters and/or lengths and transporting the same to a testing station of an analytical device, comprising:

a body having a top and a bottom and a rear portion, said body including:

a base;

a front wall, longitudinally extending across said base, having a plurality of equidistantly spaced openings arranged in a row lengthwise of the cassette and extending from the base to the top of the body, each of said openings having an upper edge;

an intermediate wall, spaced from said rear portion of said body, longitudinally extending across said base, having a plurality of equidistantly spaced openings arranged in a row lengthwise of the cassette and extending from the base to the top of the body, individual ones of said spaced openings of said front and intermediate wall being in opposed, aligned, spaced apart, relationship;



biasing means, connected to said body and lying between said front and intermediate walls, for positioning the upper edges of all said plurality of sample containers which are disposed within said spaced openings of said front and intermediate walls in the same horizontal plane;

a plurality of equidistantly spaced channels arranged in a row lengthwise of the cassette and extending from the base to the top of the body and from said intermediate wall to the end of the rear portion of said body and open ended thereat and arranged to permit entry of a rod member; and

said top portion of said body between said front and intermediate walls defining an unobstructed longitudinal passage extending above the upper side portions of said sample containers.

4,534,466

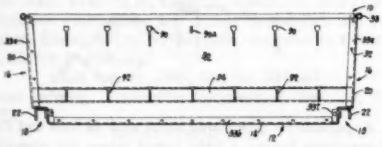
NESTABLE CONTAINER FOR PARTS STORAGE

Kenneth L. Wood, Santa Maria, Calif., assignor to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 381,184, May 24, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,246

Int. Cl.[3] **B65D** *21/02, 25/06, 25/28*

U.S. Cl. 206—518 **12 Claims**



1. A nestable container for use with automatic storage/retrieval systems comprising:

(a) a base element including a bottom wall and two diverging end walls extending upwardly from said bottom wall, said end walls and said bottom wall being one integral element;

(b) said bottom wall including integral bottom flanges extending upwardly and diverging with respect to each other;

(c) a juncture of each end wall with said base element being defined by an inverted L-shaped wall segment, said L-shaped wall segment being substantially the full width of its associated end wall, each inverted L-shaped segment defining a lower recess having depth and longitudinal dimensions substantially less than the depth and longitudinal dimensions of the adjacent side and bottom walls;

(d) each of said end walls also including end flange parts extending normally from the sides thereof and toward the other end wall;

(e) two side walls fixed to each side of said base element and welded along said end flanges and said bottom flanges, said side walls diverging with respect to each other, said bottom wall, end walls and side walls defining a container interior;

(f) each of said side walls including structure defining an upper recessed portion spaced from said bottom wall and extending into the interior of the container, toward the opposed side wall, said structure defining a nesting stop for containers of similar dimensions stacked within said container; and

(g) two engagement members, one fixed in each lower recess, each engagement member including unobstructed opened ends adapted to engage a mechanical moving means forming part of the storage/retrieval system for effecting movement in said container in a transverse direction, the engagement members being respectively disposed inwardly of a plane located by an outer surface of the adjacent end wall.

4,534,467

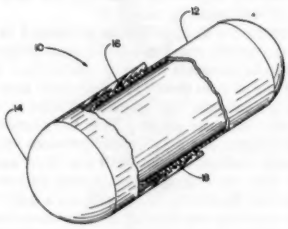
TAMPERPROOF CAPSULE

Daniel L. Rathbun, P.O. Box 503, Hominy, Okla. 74035

Continuation of Ser. No. 469,201, Feb. 24, 1983, abandoned. This application Nov. 2, 1984, Ser. No. 668,172

Int. Cl.[3] **A61B** *19/02;* **B65D** *43/10*

U.S. Cl. 206—530 **1 Claim**



1. A self-locking, tamperproof, capsule comprising:

(a) a capsule body having an essentially cylindrical sidewall with one end open and other end closed;

(b) a first saw-toothed engagement means circumferentially positioned on the outer surface of said cylindrical sidewall;

(c) a capsule cap having an essentially cylindrical sidewall with one end open and the other end closed wherein said cylindrical sidewalls of said capsule body and capsule cap are adapted to telescopically engage with each other thus forming said capsule; and

(d) a second saw-toothed engagement means circumferentially positioned on the inner surface of said cylindrical sidewall of said capsule cap wherein said saw-toothed engagement means are adapted to engage with each other when said capsule body and capsule cap are telescopically assembled thus locking said capsule and wherein said first and second saw-toothed engagement means when engaged are self-destructive when forced open.

4,534,468

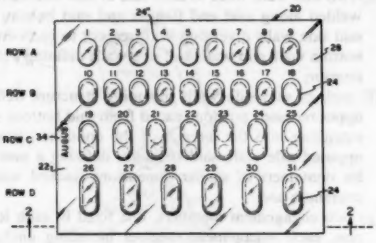
CALENDAR-ORIENTED PILL DISPENSER

Walter S. Nuckols, 119 Putnam Park Rd., Bethel, Conn. 06801; Walter G. Leonard, 1017 Main St., Melrose, Mass. 02176, and Henry P. Doble, Jr., Sunnyview Dr., Redding, Conn. 06875

Filed Dec. 19, 1983, Ser. No. 563,148

Int. Cl.³ B65D *85/56, 83/04;* **G09F** *9/00*

U.S. Cl. 206—534 **20 Claims**



1. A unitary, non-reusable dispenser for the storage, dispensing, and patient compliance indication of calendar oriented pills comprising:

(A) a plurality of domes corresponding on a one-to-one basis with the days of at least one calendar month, each dimensioned for overlying one or more pills, the domes arranged in at least one row;

(B) a backing sheet with a front and rear surface, the backing sheet formed from a relatively stiff planar material with the domes positioned on the front surface thereof, the backing sheet having a plurality of zones corresponding to those areas overlaid by the domes, said zones being rupturable for release of the pill or pills which can be stored in the enclosure formed by the zone and the corresponding dome;

(C) consecutive integer indicia positioned in proximity to the domes in a one-to-one relationship thereto, so as to visually identify each dome with one and only one calendar date of said calendar month;

(D) consecutive integer indicia positioned in proximity to said rupturable zones in a one-to-one relationship thereto so as to be viewable from the rear surface of the backing sheet and so as to visually identify each zone with one and only one calendar date of said calendar month;

whereby the dispenser stores pills in the plurality of pill-containing enclosures in a manner that provides visual identification of each enclosure from both the front and rear of the dispenser, with one and only one calendar date of said calendar month, so that dispensing of the pills on a daily basis is facilitated and whereby monitoring of user compliance with the calendar oriented regimen is facilitated by identification of the pill-containing enclosures which are not dispensed for any given calendar date.

4,534,469

TRAY ASSEMBLY

Thad F. Elsmo, 208 E. Four Mile Rd., Racine, Wis. 53402

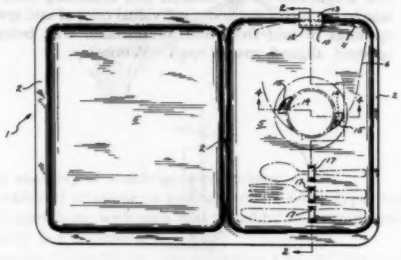
Filed Nov. 2, 1983, Ser. No. 547,838

Int. Cl.³ B65D *3/24*

U.S. Cl. 206—560 **12 Claims**

1. A tray assembly, comprising a tray member having a substantially planar web portion and a pocket extending downwardly from said web portion defined by a bottom wall spaced from said web portion and side walls interconnecting said bottom wall and web portion, a cup member removably mounted in said pocket and movable between a folded storage position and an upright usage position, said cup member includes a substantially cylindrical body open at its top and closed at its bottom, said body defining an upright longitudinal axis when in said usage position, and means for folding said body to said storage position wherein said body extends normal to said upright axis, and means for releasably holding said cup member in its storage position, said releasable holding means includes a clip member having one end connected to said web portion and its other end projecting inwardly toward said pocket.

10. In combination, a tray member having a substantially planar web portion and a pocket extending downwardly from said web portion defined by a bottom wall spaced from said web portion and side walls interconnecting said bottom wall and web portion, covering means overlying said web portion



and pocket for sealingly covering said tray member, housing means including a pair of side walls defining a compartment for slidably receiving and supporting said tray member, and cooperating means on said tray member and said housing means for automatically breaking said sealing cover when said tray member is removed from said housing means, said cooperating means includes a rod within said compartment extending across said housing means between said side walls and a clip member having one end connected to said web portion and its other end projecting inwardly toward said pocket.

4,534,470

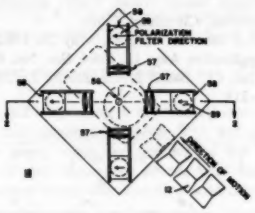
APPARATUS AND METHOD FOR PROCESSING FRUIT AND THE LIKE

George A. Mills, Three Rivers, Calif. 93271

Filed Sep. 30, 1982, Ser. No. 430,084

Int. Cl.³ B07C *5/342*

U.S. Cl. 209—585 **12 Claims**



1. Apparatus for processing items such as fruit and the like, said apparatus having a light signal means for viewing said items and developing a plurality of data signals corresponding to respective portions of the surface of each said item, said plurality of data signals corresponding to substantially the entire surface of each said item, having means for moving successive items into position to be viewed by said light signal means, characterized by:

means for illuminating each said item substantially uniformly over substantially the entire surface thereof being viewed by said light signal means;

difference means for obtaining a plurality of difference signals by subtracting the values of data signals from said

light signal means corresponding to adjacent portions of the surface of each said item and means for sorting said items as a function of said difference signals;

said illuminating means comprising a plurality of light sources directing light at a portion of said item, said light sources being arranged substantially in a plane displaced from said item as it is being viewed; and

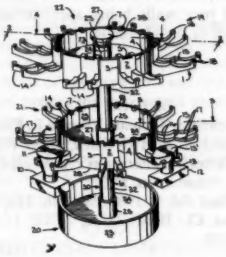
said light sources further comprising a single lamp with light emitted therefrom and a plurality of mirror means each receptive to said emitted light for redirecting said emitted light toward said item from a plurality of different directions.

4,534,471

STAMP HOLDING CLIP AND RACK THEREFOR

William L. Zahn, Brookfield, and Fred W. Kufrin, Janesville, both of Wis., assignors to Schwaab Inc., Milwaukee, Wis.

Filed Apr. 27, 1983, Ser. No. 488,678
Int. Cl.³ A47F 5/02
U.S. Cl. 211—39 **11 Claims**



1. A storage device including a clip for mounting the handle of a rubber stamp or the like, said clip of said storage device comprising:

(a) a base,

(b) a pair of relatively rigid arms extending from said base,

(c) the opposed inner surfaces of said arms diverging outwardly from said base to the outer ends of said arms and being adapted to engagingly support handles of a variety of sizes,

(d) and opposed inwardly facing handle retainer means disposed on the outer ends of said arms,

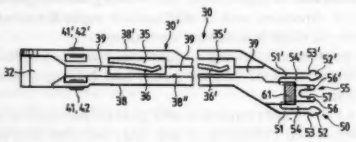
(e) each of said arms having a plurality of arcuate top edge surfaces for free suspension of stamp handles therefrom.

4,534,472

GUIDE RAIL FOR ELECTRONIC MODULE SUPPORTS

Urs Hänseler, Pfaffhausen; Urs Meier, Bassersdorf, and Franz Muther, Zürich, all of Switzerland, assignors to Contraves AG, Zürich, Switzerland

Filed Sep. 19, 1983, Ser. No. 533,663
Claims priority, application Switzerland, Sep. 30, 1982, 5778/82
Int. Cl.³ H02B 1/02
U.S. Cl. 211—41 **12 Claims**



1. A guide rail for electronic module supports for latchable attachment to at least one transverse support member of a rack, comprising:

a guide rail body possessing a substantially U-shaped cross-section and having opposite end regions;

a first latching element provided at one end region of said substantially U-shaped guide rail body;

a second latching element provided at the other end region of said substantially U-shaped guide rail body;

each of said first and second latching elements being provided with a respective pair of resiliently formed latching heads which can engage with spaced-apart apertures separated by cross-pieces;

a respective separating element disposed between each said latching head of said pair of latching heads of each of the two latching elements;

each said separating element having a substantially U-configuration opening away from said guide rail body;

said substantially U-configuration including two spaced legs extending substantially parallel to said resiliently formed latching heads; and

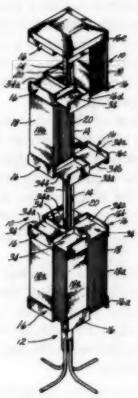
each said separating element being structurally proportioned to be selectively inserted into the apertures or on to the cross-pieces arranged between the apertures.

4,534,473

DISPLAY STAND

William L. Post, Chatsworth, Calif., assignor to Pacific Display Corporation, Chatsworth, Calif.

Filed Dec. 28, 1983, Ser. No. 566,318
Int. Cl.³ A47F 5/02
U.S. Cl. 211—58 **8 Claims**



1. A display rack comprising:

a base;

an elongated shaft rotatably mounted on the base extending away from the base, the elongated shaft having at least one groove in its outer surface extending along the lenght of the shaft;

at least one shelf mounted on the shaft, such a shelf having an opening therethrough; and

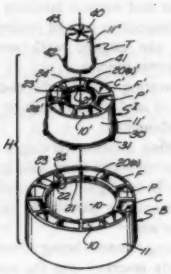
at least one elongated guide on the shelf extending into the opening from the side of the opening, such an elongated guide being along the height of the opening and aligned for sliding engagement in the shaft groove when the shelf is being mounted on the shaft so that when the shelf is in position on the shaft, the shaft is throught the shelf opening and the shelf guide is frictionally engaged in the shaft groove.

4,534,474

COLLAPSIBLE KITCHEN UTENSIL HOLDER

Min-Hing Ng, Kowloon, Hong Kong, assignor to Concord Tool and Machine Company, Hong Kong, Hong Kong

Filed Sep. 30, 1982, Ser. No. 430,279
Int. Cl.³ A47F *5/02, 7/00*
U.S. Cl. 211—70 **10 Claims**



1. A multi-sectional utensil holder interchangeable between a stored position and an operative position, comprising:

a base section having concentric, annular, radially spaced inner and outer walls of predetermined diameters, with circumferentially spaced, radially extending partitions therebetween to provide a plurality of storage compartments, said walls having top and bottom edges, the top edges of the inner and outer walls being generally in a co-planer relationship;

an intermediate section having concentric, annular, radially spaced outer and inner walls of predetermined diameters, with circumferentially spaced, radially extending partitions therebetween to provide a plurality of storage compartments, said walls having upper and lower edges, the upper edges of the inner and outer walls being generally in a co-planer relationship;

the vertical dimension of the outer wall of the intermediate section being less than the vertical dimension of the inner wall of the base section, and the diameter of the outer wall of the intermediate section being less than the diameter of the inner wall of the base section, whereby the intermediate section in the inverted position is nested within the confines of the inner wall of the base section for shipping purposes; and

interengageable, releasable coupling means adjacent the lower edge of the outer wall of the intermediate section and adjacent the top edge of the inner wall of the base section, whereby the intermediate section is positioned on and releasably coupled with the base section to provide a two-tier utensil holder.

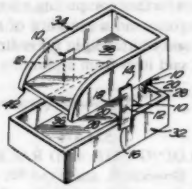
4,534,475

TRAY STACKING

Irving A. Mayo, Douglaston, N.Y., assignor to Artistic Desk Pad & Novelty Co., Inc., Bronx, N.Y.

Filed Mar. 14, 1983, Ser. No. 475,009
Int. Cl.³ A47F *3/14*
U.S. Cl. 211—126 **1 Claim**

1. In combination, three members connecting two superposed rectangular trays having vertical walls about at least three sides and a base; each connecting member being integrally molded of a substantially rigid plastic but of a thickness so that it is flexed slightly in assembled state, each connecting member comprising a slightly bowed substantially vertical riser having upper and lower ends and a middle, first and second vertically spaced substantially horizontal elements projecting from the vertical riser near their respective ends and a wall element on each of said horizontal elements, the wall elements projecting away from each other, each wall element defining with the vertical riser a tapered channel of maximum width at the horizontal element, the upper wall element terminating shorter than its riser end and the lower wall element terminating approximately at the same height as its riser end, the upper wall element at its end remote from its horizontal element being provided with a lip projecting inwardly of its



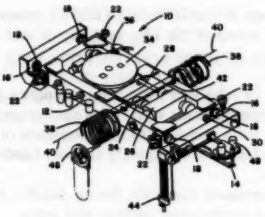
channel; the vertical walls of at least the upper tray projecting downwardly below the base, the downward projection of each vertical tray wall being joined to a vertical wall of the tray therebelow by one of said members, the lip of each member engaging the downward vertical wall projection, the thickness of the vertical tray walls being approximately equal to the maximum width of the channels.

4,534,476

BRIDGE CRANE

William L. Burchfield, Tacoma; Edward L. Carr, and Gordon J Laskowski, both of Port Orchard, all of Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1983, Ser. No. 510,703
Int. Cl.³ B66C *23/52, 17/00, 11/02*
U.S. Cl. 212—190 **3 Claims**



1. An overhead crane for use in a shipboard environment, which comprises:

(a) a machinery carrying body, overhead rails mounted in said shipboard environment, said body having means for supporting said body for movement on said overhead rails;

(b) traversing means for moving said body along said overhead rails, said traversing means including

(1) a source of pressurized air, an air motor mounted an said body, said air motor including an output shaft, a respective first and second air input means, said air motor being adapted to selectively receive pressurized air from said source at said first input for rotating said output shaft in a first direction, and at said second input for rotating said output shaft in a second direction;

(2) gear means having a gear input shaft coupled to said output shaft of said air motor and having a gear output shaft;

(3) a drive shaft coupled to said gear output shaft of said gear means and extending in said body between said overhead rails;

(4) gear rack means mounted on said overhead rails;

(5) drive pinions mounted on the distal ends of said drive

shaft, said drive pinions being operative to engage said gear rack means on said overhead rail for moving said body therealong;

(6) means for manually rotating said gear input shaft to move said body along said overhead rails;

(c) brake means coupled to said gear input shaft for preventing movement of said crane, said brake means being normally mechanically engaged and pneumatically released when pressurized air is coupled to said air motor for traversing said crane;

(d) a load hoist means, rail means for supporting said hoist means, said rail means being removably attached to said body; and

(e) a pneumatic control circuit for controlling the motion of said crane including

(1) a first interlock valve receiving pressurized air, said first interlock valve being mechanically biased in the open position to allow passage of said pressurized air, said first interlock valve having a pneumatically operated pilot for closing said first interlock valve;

(2) a shutoff valve adapted to receive pressurized air from said first interlock valve, said shutoff valve being manually actuated to allow passage of said pressurized air in the open position or prevent passage of said pressurized air in the closed position;

(3) a manually actuated control valve adapted to received the pressurized air from said shutoff valve, said control valve when in a first position coupling said pressurized air to said first input of said air motor and in a second position coupling said pressurized air to said second input of said air motor; and

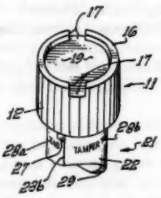
(4) a brake release valve adapted to be actuated by said pressurized air from said control valve to release said brake means when actuated.

4,534,477

ONE-PIECE CHILDPROOF TAMPER-EVIDENT BOTTLE AND CAP

Herman Laub, III, 244 N. San Marino, San Gabriel, Calif. 91775

Filed Feb. 27, 1984, Ser. No. 583,886
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—215 **13 Claims**



1. In combination for use in containing products, a bottle-and-cap combination that resists being unsealed and opened, from a fully-threaded-on position, but that can be unsealed and opened by application of torque exceeding the level that can generally be exerted by children; said combination comprising:

a bottle that is adapted to contain such products and that has:

a neck,

a generally helical outwardly projecting thread defined in the outer surface of the neck, and

an outward projection from the neck, immediately above or below a particular segment of the helical thread; and

a cap that is adapted to block passage of such products from the bottle, and that has:

a generally cylindrical body,

an end wall closing the upper portion of the cylindrical body,

a generally helical inwardly projecting thread defined in the inner surface of the cylindrical body and adapted to mate with the outwardly projecting thread defined in the outer surface of the neck, to removably secure the cap to the neck, and

a gap in a particular segment of the inwardly projecting thread, at a location that corresponds, when the cap is substantially fully threaded onto the bottle, to the location of the outward projection from the neck of the bottle;

the cap being substantially fixed axially with respect to the bottle by the mating threads when the cap is substantially fully threaded onto the bottle;

wherein the outward projection from the neck of the bottle enters the gap in the inwardly projecting thread, when the cap is substantially fully threaded onto the bottle, and obstructs starting of the removal of the cap from the bottle away from such fully-threaded-on position unless unthreading torque is applied which exceeds a level that can generally be exerted by most children;

the cap substantially blocking passage of products when it is obstructed by the inward projection from the neck; and

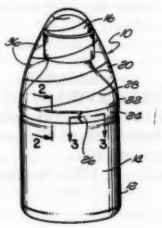
wherein the otuward projection from the neck of the bottle does not effectively resist starting of the removal of the cap from the bottle if unthreading torque is applied which exceeds a level that can generally be exerted by most children but which is readily exerted by most adults.

4,534,478

TAMPER INDICATING COVER

Nina P. Sawicki, 8347 Ranchito Ave., Panorama City, Calif. 91402

Filed Feb. 16, 1983, Ser. No. 467,103
Int. Cl.³ B65D *41/48, 51/20*
U.S. Cl. 215—230 **12 Claims**



1. A tamper-indicating cover for a container having a neck and a shoulder at a spaced location below the neck, the container closed by a cap and having an annular indent adjacent the shoulder, the cover comprising:

a tearable shroud portion positioned over the cap in access-preventing relationship thereto and having an annular junction region;

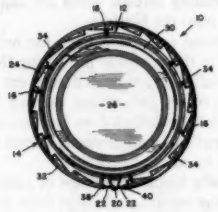
an annular safety band integral with the shroud portion and extending from the annular junction region of the shroud, the band extending into the annular indent of the container for sealing the cover to the container thereby enclosing the cap; and

a pull tab extending from the safety band for being pulled to effect tearing of the safety band relative to the shroud to effect removal of the cover from the container and removal of the safety band from the annular indent to expose the indent to observation and give access to the container cap.

4,534,479
TAMPER EVIDENT CONTAINER CLOSURE

Vincent N. Conti, West Hempstead, N.Y., assignor to American Safety Closure Corp., Farmingdale, N.Y.

Filed Aug. 15, 1984, Ser. No. 640,900
Int. Cl.[3] B65D *49/12*
U.S. Cl. 215—252 4 Claims



1. A tamper evident container closure for a container having a threaded mouth portion and a plurality of teeth members adjacent said mouth portion, said container closure comprising:

(a) a threaded cap for engaging the mouth portion of the container;

(b) a split ring including

(i) first and second adjacent spaced ends, and

(ii) a plurality of pawls for interlockably engaging the teeth members of the container to inhibit twisting of the split ring off the mouth portion of the container as the cap is twisted off said mouth portion;

(c) a plurality of frangible members radially extending between the split ring and the cap to connect the split ring breakably thereto;

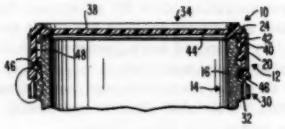
(d) a pointer connected to the cap and radially extending outward therefrom, generally midway between the spaced ends of the split ring, to engage the ring as the cap is twisted relative thereto; and

(e) at least one frangible finger circumferentially extending between the pointer and an end of the split ring to connect the pointer breakably thereto.

4,534,480
TAMPER EVIDENT CLOSURE

Paul A. Santostasi; Herbert V. Dutt, both of Sarasota, and Arno F. Pirkau, Bradenton, all of Fla., assignors to Sun Coast Plastics, Inc., Sarasota, Fla.

Filed Jun. 1, 1984, Ser. No. 616,108
Int. Cl.[3] B65D *41/34*
U.S. Cl. 215—252 5 Claims



1. A tamper evident closure for a container having an open mouth which is closed by the closure, said tamper evident closure comprising:

a closure cap having a generally circular top and a generally cylindrical sidewall extending downwardly from said top, said sidewall including interior screw threads which cooperate with exterior screw threads on the container to secure said closure cap to the container;

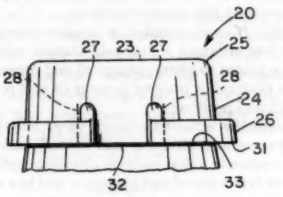
a tamper evident band secured by a plurality of spaced bridge strips to a bottom surface of said sidewall, said tamper evident band having an outer diameter generally the same as an outer diameter of said sidewall and a thickness equal to or less than a thickness of said sidewall; and

a plurality of spaced ratchet teeth formed on an inner surface of said tamper evident band and being circumferentially aligned with said bridge strips, said ratchet teeth cooperating with ratchet lugs on the container to cause said tamper evident band to become separated from said sidewall of said cap when said cap is removed from the container.

4,534,481
SNAP-ON, TAMPER-EVIDENT CONTAINER CLOSURE

Kenneth L. Summers, Angola, and Gary M. Baughman, Auburn, both of Ind., assignors to Rieke Corporation, Auburn, Ind.

Filed Aug. 2, 1984, Ser. No. 636,910
Int. Cl.[3] B65D *41/48, 41/32*
U.S. Cl. 215—253 12 Claims



1. A flexible, plastic, snap-on closure for use in combination with a container in order to seal closed said container in a tamper-evident manner wherein the neck of the container is configured with a top rim portion defining a container opening, an outwardly opening annular channel disposed below said top rim portion, a generally cylindrical side wall and a shoulder providing a substantially horizontal abutment surface outward of said side wall and wherein said snap-on closure comprising:

a flexible closure body having a top surface and a generally cylindrical surrounding side wall;

an inwardly protruding annular rib;

an annular connecting portion disposed between said annular rib and said top surface and arranged to define an inwardly opening annular channel;

a bail handle attached to said surrounding side wall by means of two, spaced-apart attachment ribs integral with said bail handle, said side wall including a pair of score lines, each score line being disposed adjacent a corresponding attachment rib;

said annular rib being suitably configured to fit within said outwardly opening channel, and said inwardly opening annular channel being suitably configured to snugly receive said top rim whereby the snap-on receipt of the closure by the container creates a sealed and closed condition of the container by means of said snap-on closure; and

said closure having an axial height which is sufficient relative to its diameter and material flexibility in order to prevent removal of said closure without some indication of said tampering being evident on the closure.

4,534,482
STOPPERING DEVICE FOR BOTTLES

Michel Bouché , Les Salomons, 63300 Thiers, France

Filed May 23, 1984, Ser. No. 613,147
Int. Cl.[3] B65D *45/30*
U.S. Cl. 215—272 7 Claims

1. A stoppering device for a bottle whose neck has a protruding lip which surrounds the mouth thereof, the device comprising:

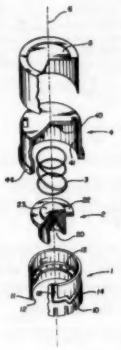
A. a sealing member receivable in the mouth of the bottle;

B. a cylindrical inner part having a lower section slotted to define a multilobe skirt, each lobe of which terminates in

an inner tooth, said inner part being adapted to engage the neck of the bottle and to apply said sealing member onto the mouth thereof;

C. a cylindrical outer part forming a locking member adapted to surround the skirt and the slide along the inner part so as to place the teeth of the skirt below the rim of the bottle and hold the teeth at that position;

D. a pair of ramps recessed in the outer surface of the inner part, each ramp being defined by an upper wall and a lower wall; and



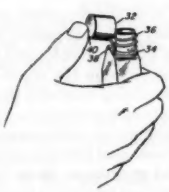
E. a pair of tenons protruding from the outer part, each tenon being adapted to travel in a respective ramp between a locking and an unlocking position, further characterized by the fact that the lower wall of each ramp is extended beyond a first generatrix on the inner part which passes through the lowest point on the upper wall of the ramp by a distance which is sufficient to permit the tenon, upon rising along a second generatrix to reach and occupy a housing located beyond the lowest point of the upper ramp wall.

4,534,483

CULTURE FLASK CLOSURE

Amin I. Kassis, 57 Stockdate Rd., Needham, Mass. 02192, and Choukrie Akili-Mudarris, 533 Pleasant Wind Dr., Aberdeen, Md. 21001

Filed Jan. 5, 1983, Ser. No. 455,805
Int. Cl.[3] B65D *55/16*; C12M *1/24*
U.S. Cl. 215—306 **13 Claims**



1. In a cell-culture flask comprising a flask body with a neck comprising a wall that defines an opening to said body and a generally tubular cap including means for covering said neck opening, that improvement comprising:

(a) an orientation strip attached at one end to said flask and at the opposite end to said cap, said strip along a portion of its extent being securely fastened to the tubular said wall of said cap along a substantially straight line,

said strip having sufficient strength to support said cap in a protective position in which the cap overlaps and covers said neck opening and the lower portion of said cap is immediately adjacent the upper portion of said neck, said strip comprising an elongated connecting section between said cap and said flask, said connecting section being substantially in a straight line with said portion of said strip securely fastened to said cap when said cap is in said protective position,

said strip having sufficient flexibility to allow manual displacement of said cap readily from said protective position to a second position in which said cap does not obstruct the introduction of a pipette into said opening,

said strip having a memory to return said cap to said protective position from all operative positions other than said protective position in the absence of any force external to said cap tending to move said cap away from said protective position; and

(b) a tab extending above the top of said cap in a direction generally parallel to the axis of said cap,

whereby said flask may be readily charged while maintaining sterile conditions, by manually displacing said cap from said protective position to said second position facilitated by said tab, inserting a pipette into said opening, discharging the contents of said pipette into said flask, removing said pipette from said flask, and allowing said cap to return to said protective position.

12. A reusable closure device for a container with a threaded neck comprising a wall defining an opening to the interior thereof, said container being used in connection with cell culturing, said device comprising

a generally cylindrical screw-up for threadably sealably closing said neck opening,

a collar which encircles and freely turns about said neck opening, and

an orientation strip attached at one end to said cap and at the opposite end to said collar said strip along a portion of its extent being securely fastened to the cylindrical side wall of said cap along a substantially straight line

said strip having sufficient strength to support said container cap in a first position in which the cap overlaps and covers said neck opening without threadably, sealably closing said opening and the lower portion of said cap is immediately adjacent the

said srip having sufficient flexibility to allow manual displacement of said cap from said first position to a second position in which said cap does not obstruct the introduction of a pipette into said opening, said strip comprising an elongated connecting section between said cap and said flask, said connecting section being substantially in a straight line with said portion of said strip securely fastened to said cap when said cap is in said first position,

said strip having a memory to return said cap to said first position from all operative positions other than said first position in the absence of any force external to said cap tending to move said cap away from said first position,

said container further comprising a tab extending above the top of said cap in a direction generally parallel to the axis of said cap, to facilitate displacement of said cap from said first position,

whereby access to the interior of said container is achieved while maintaining sterile conditions.

4,534,484

WATER COOLER BOTTLE CLOSURE

Francois Deland, 250 Montigny, Mont St-Hilaire, Quebec, Canada J3H 2L9

Filed Sep. 29, 1982, Ser. No. 428,396
Int. Cl.[3] B65D *41/28*
U.S. Cl. 215—307 **6 Claims**

1. A water cooler bottle closure comprising:

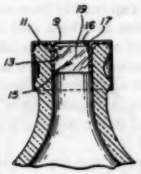
a closure cap adapted to fit over the neck of a water cooler bottle,

said closure cap having an opening formed at the bottom thereof,

a continuous wall projecting around the periphery of said opening to define an inner chamber which is associated

with said closure cap and is adapted to fit inside the neck portion of the water cooler bottle,

said continuous wall being set back with respect to said opening to define a flange,



a base including means engageable by said flange to imperviously close one end of said chamber so as to enable the formation of an ice plug in said inner chamber when said inner chamber has been filled with water and said water has been subjected to freezing conditions.

4,534,485

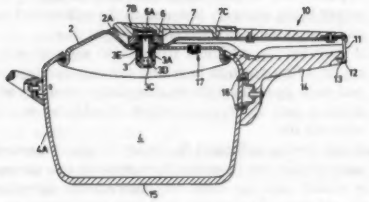
PRESSURE COOKERS HAVING VENT MEANS

Naranammalpuram S. Subramanian, C-21-22 U-Road, Wagle Estate, Thana 400604, State of Maharashtra, India

Filed Sep. 24, 1984, Ser. No. 653,544

Int. Cl.³ B65D *51/16*

U.S. Cl. 220—203 **7 Claims**



1. In and for a pressure cooker, a pressure regulating valve which is fitted to the lid of the vessel comprising a vent tube and a vent weight which vent weight is seated over the upper end of the vent tube, said vent weight having a downwardly extending pin to slide through a vertical bore in the head of the vent tube, the base of the vent weight from which the pin depends having one or more openings for the escape of steam when the vent weight is lifted, the vent weight being held by a fulcrumed lever which has a passage exposed at one end to the atmosphere and at the other end to the said opening or openings in the vent weight so that when the fulcrumed lever is manually operated it will cause the pin to be lifted to release the vertical bore of the vent tube thereby allowing the steam to escape into the atmosphere or when the pressure of the steam developed in the vessel exceeds a desired limit, the vent weight is lifted to allow the steam to be released through the vertical bore of the vent tube, the opening/openings in the vent weight and the passage in the fulcrumed lever being exposed to the atmosphere.

4,534,486

COVER PLATE FASTENING DEVICE

Lawrence E. Eidson, 33586 Breckenridge, Sterling Heights, Mich. 48077

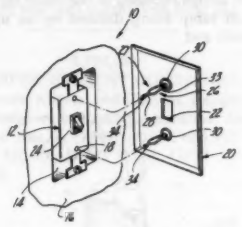
Filed Mar. 29, 1984, Ser. No. 594,839

Int. Cl.³ N02H *3/14*

U.S. Cl. 220—241 **20 Claims**

1. A snap-on cover for electrical boxes having at least one aperture adapted to threadably engage a threaded fastener, said cover comprising;

a cover plate having a front face and a rear face and at least one elongated prong extending outwardly from the rear face of said cover plate, each said prong having a compressible, radially expanded portion, and means for resiliently urging said compressible expanded portion to a radial dimension larger than the diameter of said aperture, and



means for securing each said prong to said cover plate so that each said prong is axially aligned with said aperture and so that said compressible, radially expanded portion is insertable within said aperture.

4,534,487

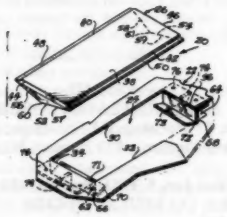
BLIND SECUREMENT OF COVER PLATES AND THE LIKE

George M. Rapata, 216 Woburn La., Schaumburg, Ill. 60194

Filed Oct. 11, 1984, Ser. No. 659,960

Int. Cl.³ B65D *51/04*

U.S. Cl. 220—305 **13 Claims**



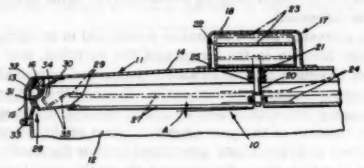
1. An assembly of the type described comprising a workpiece having an opening defined in part by spaced apart opposite marginal portions, a cover plate for said opening, and blind securement means for securing the cover plate within said opening, said cover plate being insertable through said opening for assembly, said securement means including shoulder means at opposite sides of said cover plate respectively engageable beneath said opposite marginal portions when the cover plate is fully assembled, said securement means further comprising first cover plate cam surface means and second workpiece cam surface means disposed for cooperative engagement with each other, means resiliently supporting at least one of said cam surface means for enabling the cover plate and one side shoulder means to be initially inserted through said opening and beneath one of said margins sufficiently to enable the opposite side shoulder means to clear the other of said margins portions without substantially displacing said one cam surface means and for yielding upon depression of the cover plate sufficiently to move said other side shoulder means beneath said other marginal portion and for subsequently resiliently clamping said opposite side shoulder means beneath said opposite marginal portions.

4,534,488

LOCKING DEVICE FOR GARBAGE CAN LID

John A. Boggs, 270 Tampa Dr., Apt. N-2, Nashville, Tenn. 37211, and Robert J. Baltz, 208 Foxwood La., Nashville, Tenn. 37210

Filed Nov. 21, 1984, Ser. No. 673,592
Int. Cl.³ B65D *45/28*
U.S. Cl. 220—323 **8 Claims**



1. In a container having a substantially cylindrical wall and an open top, and an annular recess adjacent the open top and opening radially inward from the cylindrical wall, and a lid covering the open top having a top wall, a locking device, comprising:

(a) a handle member having a transverse handle bar fixed to the top wall,

(b) a vertical operating rod having an upper end portion and a lower end portion,

(c) an opening in the top wall beneath said handle bar for receiving said operating rod for vertical reciprocable movement,

(d) a latch handle fixed to said upper end portion of said operating rod and spaced below said handle bar when said operating rod is in a lower locking position,

(e) at least one connecting rod rigidly connected to said lower end portion of said operating rod and projecting radially outward toward the container wall,

(f) a latch member having upper and lower ends and a bowed elastic intermediate portion,

(g) said upper end being fixed to the top wall of the lid and spaced inwardly from the container wall, and said lower end being fixed to said connecting rod, so that said bowed intermediate portion projects radially outward in latching engagement with the annular recess of the container wall when said operating rod is in said locking position, said bowed intermediate portion being flexed to a retracted position disengaging the annular recess when said operating rod is in an upper unlocking position.

4,534,489

BIOHAZARD WASTE CONTAINER

James V. Bartlett, 1714 Sherman Ave., Janesville, Wis. 53545

Filed May 11, 1984, Ser. No. 609,464
Int. Cl.³ B65D *5/08, 5/60*
U.S. Cl. 220—404 **7 Claims**

1. A carton for containment of waste material, said carton being formed from a unitary corrugated paperboard blank, and said carton comprising:

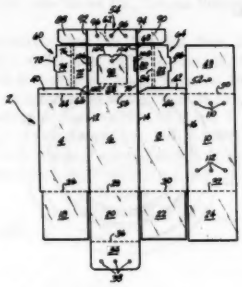
(a) a plurality of side wall panels hingedly connected together to form a tubular body;

(b) a plurality of bottom wall panels foldably connected to bottom edges of said side wall panels and overlappingly disposed to form a multi-ply bottom for said carton;

(c) a top cover assembly foldably connected to a top edge of one of said side wall panels, said top cover assembly including a plurality of side panels operative to overlie upper portions of said side wall panels when said top cover assembly is in a closed position, and said top cover assembly further including a top wall extending between said side panels to close the top of said carton when said top cover assembly is in said closed position;

(d) a swinging door panel formed within said top wall and pivotally connected thereto to allow access therethrough to the interior of said carton;

(e) a display—inner top closure panel pivotally connected to a top edge of a second one of said side wall panels, said display—inner top closure panel being pivotable between a first position overlying an outside surface of said second



side wall panel and a second position underlying said top wall when said top cover assembly is in said closed position; and

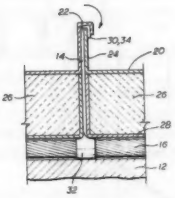
(f) means for securing said swinging door panel to said display—inner top closure panel when the latter is in said second position.

4,534,490

INSULATED PANEL SYSTEM FOR STORAGE TANKS

Mark A. McBride, P.O. Box 1570, La Porte, Tex. 77571

Filed Dec. 3, 1984, Ser. No. 677,596
Int. Cl.³ B65D *25/16, 90/06*
U.S. Cl. 220—435 **12 Claims**



1. A panel system for a storage tank wall and the like comprising:

a plurality of band means arranged circumferentially on and about the outside surface of the tank wall;

means for securing and tightening each of said band means;

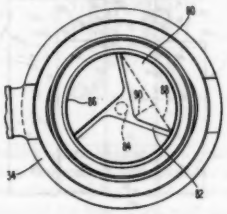
a plurality of panels secured crosswise of and against said plurality of band means, each of said panels comprising first and second upstanding and opposed side flanges;

fastener means securing a pair of panels to each band means, each of said fastener means having two ends and a middle section with said middle section interposed around each of said band means with said two ends positioned between said first and said second upstanding and opposed side flanges of adjacent panel sections and folded over the top of said first side flange on one adjacent panel about which the second side flange of an adjacent panel section is rolled over said fastener means and said first side flange.

4,534,491
WET TISSUE DISPENSING PORT

Henry J. Norton, Wilmington, Del., and Kenard E. Urion, Woodbury, N.J., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Jul. 6, 1982, Ser. No. 395,568
Int. Cl.[3] A47K *10/38*
U.S. Cl. 221—63 5 Claims

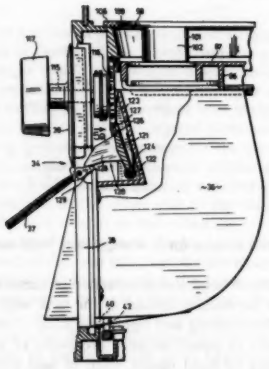


1. An improved dispensing port in a wall of a container for perforated premoistened wipers, the dispensing port consisting of a central opening and three lineal slots tangent to the central opening to form three flexible, obtuse triangular flaps, the obtuse angle of each flap being rounded, the flaps applying tension to a leading wiper being pulled through the slots to cause the leading wiper to be separated from the next wiper at the perforations while leaving a tip of the next wiper projecting through the dispensing port.

4,534,492
COIN OPERATED VENDING MACHINE HAVING A SECURE CASHBOX AND AN ANTITAMPERING SAFETY MECHANISM

Joseph W. Schwarzli, Vandorf Rd., R.R. #4, Stouffville, Ontario, Canada L0H 1L0

Filed Jan. 30, 1984, Ser. No. 576,251
Int. Cl.[3] G07F *11/44*
U.S. Cl. 221—203 29 Claims



1. A coin operated vending machine comprising:

a housing having upright walls, a base, a top, and a partition between the base and top dividing the housing into an upper product bin and a lower cashbox, the partition defining an aperture therethrough to provide communication between the bin and cashbox and having a spindle protruding upwardly from the central portion thereof;

a dispensing wheel having:

a hub with bearing means at the center thereof for engaging the spindle and supporting the wheel upon rotation thereof about the spindle; a rim with a plurality of gear teeth about the circumference of the bottom edge thereof; and retaining members being provided between the hub and the rim defining a plurality of product openings in the wheel which are uniformly spaced from one another and the centre of the wheel and being registrable with the aperture in the partition upon rotation of the wheel, said wheel retaining members in combination with the surface of the partition forming containers for items of product to be dispensed;

a coin activated gear mechanism positioned in an upright wall of the housing in the vicinity of the partition, said mechanism having a handle attached to one end of a shaft and a transmission gear attached to the other end thereof, said gear engaging the teeth about the rim of the dispensing wheel so that rotation of the gear causes rotation of the wheel;

a product delivery chute positioned within the cashbox, one end of which abuts the partition about the periphery of the aperture therethrough and the other end of which protrudes through an opening in an upright wall of the housing;

a door for the delivery chute, said door activating a safety mechanism which locks the transmission gear upon opening the door;

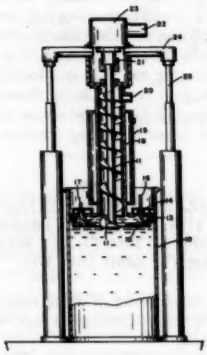
means for locking the delivery chute in place thereby restricting access to the cashbox; and

means positioned above the dispensing wheel at that portion of the partition defining the aperture therethrough for excluding all loose items of product from the aperture in the partition, thereby insuring that only items in containers are dispensed upon operation of the machine.

4,534,493
APPARATUS FOR DISPENSING HIGH VISCOSITY THERMOPLASTIC MATERIALS

Roger H. Sedran, Wayne, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 3, 1983, Ser. No. 519,875
Int. Cl.[3] B67D *5/52*
U.S. Cl. 222—146.2 6 Claims



1. Apparatus for dispensing a high viscosity thermoplastic material from a container comprising

(a) a movable platen adapted to enter the container through the top thereof, said platen being provided with seal means for peripherally contacting said container and a circular coil heating system defining a passage for steam or hot fluid disposed adjacent the underside of said platen for heating the high viscosity thermoplastic material;

(b) a screw conveyor extending through said platen and operatively secured thereto for movement therewith, said screw conveyor having an inlet disposed below the underside of said platen and an outlet disposed above the top of said platen; wherein said screw conveyor comprises a

hollow cylinder secured to said platen in a generally vertical disposition, a screw extending through the length of said cylinder and being configured and dimensioned to be snugly received by said cylinder, wherein the pitch of the screw flightings is about equal to the screw diameter for the lower half of the screw and about equal to one-half of that pitch for the upper half of the screw, and means for mechanically driving said screw; and

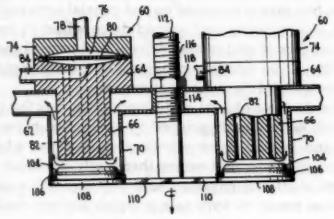
(c) said apparatus further comprising additional heating means for heating at least a portion of said cylinder.

4,534,494

CLEANING SYSTEM FOR FILLER

Jean-Claude H. Hautemont, Gif-sur-Yvette, France, assignor to Societe Anonyme dite: Etude de Realisation de Chaines Automatiques ERCA, Orsay, France

Filed Nov. 15, 1982, Ser. No. 441,976
Int. Cl.³ B67D *1/08*
U.S. Cl. 222—148 **12 Claims**



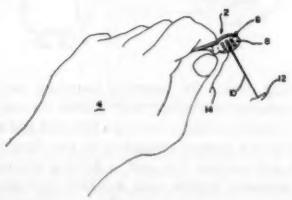
1. A cleaning system for a filler of the type including a product supply line and a dispensing nozzle, said cleaning system comprising a wash solution return, said nozzle extending through said wash solution return, a sleeve surrounding said nozzle and having an open end extending beyond said nozzle, said sleeve being carried by said wash solution return in communication therewith, closure means for selectively closing said sleeve open end to form an enclosure surrounding said nozzle and in communication with said wash solution return, and means for introducing a wash solution into said sleeve through said nozzle, said closure means being in the form of a closure member, and mounting means mounting said closure member for swinging movement into and out of alignment with said sleeve and for movement axially of said sleeve for sealing engagement therewith.

4,534,495

THIMBLE

Jean Adkins, 201 Hope Mills Rd., Fayetteville, N.C. 28304

Filed Mar. 2, 1984, Ser. No. 585,868
Int. Cl.³ D05B *91/04*
U.S. Cl. 223—101 **11 Claims**



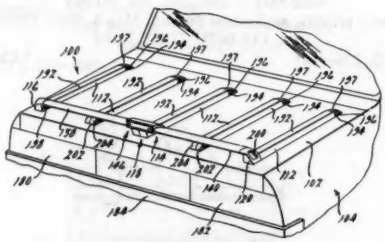
1. A thimble for use in sewing comprising an elongate handle which extends in a direction and is easily held in the hand of a quilter and a head attached to one end of said handle, said head having a broad face extending generally parallel to said direction and having means disposed on a substantial portion of said broad face for easily and securely engaging a needle without slipping such that said needle, when engaged by said face, extends transversely to said direction.

4,534,496

LUGGAGE CARRIER WITH ILLUMINATING MEANS

John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236

Continuation-in-part of Ser. No. 554,683, Nov. 23, 1983, which is a continuation of Ser. No. 485,859, Apr. 18, 1983, Pat. No. 4,440,333, which is a continuation of Ser. No. 242,138, Mar. 9, 1981, which is a continuation of Ser. No. 56,373, Jul. 10, 1979, , which is a division of Ser. No. 924,072, Jul. 7, 1978, Pat. No. 4,182,471, which is a division of Ser. No. 743,602, Nov. 22, 1976, Pat. No. 4,099,658, which is a continuation of Ser. No. 486,415, Jul. 8, 1974, abandoned. This application Jan. 18, 1984, Ser. No. 571,864
Int. Cl.³ B60R *9/00*
U.S. Cl. 224—326 **25 Claims**



1. An article carrier for an automobile including at least two parallel slats fixedly secured on a generally horizontally extending exterior automobile body surface,

said slats extending generally longitudinally of the automobile and each having upper article supporting surface, said upper article supporting surfaces of said slats being located between said body surface and the lower side of articles on said carrier, each of said slats having major and minor transverse dimensions with said major dimensions being parallel to said body surface and said supporting surfaces;

a support pad disposed between each said slat and said body surface;

a pair of article securing members secured to one end of said slats and at least one restraining bar extending laterally between and secured adjacent its opposite ends to said members, and located above said automobile body surface and said slats;

at least one support stanchion disposed on said body surface between said article securing members to further support said at least one restraining bar, a single fastener securing and passing through said stanchion; and

illuminating means disposed within said support stanchion and observable from the rearward end of the vehicle.

4,534,497

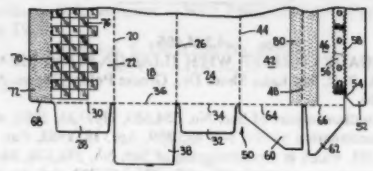
BLANK FOR CARTON FOR HOLDING AND DISPENSING PLASTIC FILM

Douglas L. Neale, Libertyville, Ill., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Nov. 7, 1983, Ser. No. 549,469
Int. Cl.³ B65D *85/671*
U.S. Cl. 225—25 **17 Claims**

1. In a carton blank for a plastic film, a panel positioned for engagement of an outer face portion thereof by a leading edge of the plastic film, said panel outer face portion having thereon

an adhesive coating to which the plastic film will stick, and a release coating on an opposite face of said panel substantially in



alignment with said adhesive coating whereby newly coated and stacked blanks will not adhere to one another.

4,534,498

GUIDING AND BRAKING UNIT FOR A MATERIAL WEB

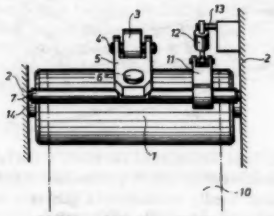
Thorsten Nilsson, Landskrona, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed May 3, 1983, Ser. No. 491,041

Claims priority, application Sweden, May 6, 1982, 8202829

Int. Cl.³ B65H *17/22, 23/08*

U.S. Cl. 226—181 **7 Claims**



1. A guide and braking device for guiding a material web including, a guide cylinder, a rotatable roller and a support arm, said support arm providing said roller with movement in two directions, said web guided between said cylinder and said roller, wherein a first direction of movement is a swivel movement in a plane parallel with a center axis through said cylinder, said first direction of movement swivels said arm about a swivelling axis extending at right angles to the center axis of the cylinder, the swivelling axis and the center axis located on either side of an extension of the cylinder radius, said roller contacting said cylinder through said web within an angle of 2° to 60° from a radius of the cylinder extending perpendicularly to said plane, said roller contacting the cylinder through said web 5° to 15° behind the cylinder radius viewed in the direction of rotation of the cylinder.

4,534,499

WIRE DRIVE MECHANISM

Ron Cox, 2208 Victoria St., Windsor, Ontario, Canada, and Elzi Pettovello, 6326 Appoline Dr., Dearborn, Mich. 48126

Filed Jan. 24, 1983, Ser. No. 460,711

Claims priority, application Canada, Jan. 29, 1982, 395204

Int. Cl.³ G03D *3/12*

U.S. Cl. 226—184 **9 Claims**

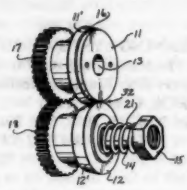
1. A drive mechanism for use in advancing an elongate object to a work station, comprising:

first and second separate, parallel shafts;

first and second frusto-conically shaped drive wheels mounted on said first and second shafts, respectively, each said drive wheel having a base, an apex, and a beveled face extending therebetween, said drive wheels being oppositely mounted on said shafts whereby the bases of said wheels face outwardly from each other and the apexes of said wheels face inwardly toward each other, said wheels being mounted in a face-engaging relationship to define a nip therebetween;

drive means coupled to said first drive wheel shaft to impart a rotational force to said first drive wheel;

idler means mounted on said second drive wheel shaft and coupled to said second drive wheel and cooperating with said drive means to impart to said second drive wheel a rotational force opposite to said rotational force of said first drive wheel;



resilient bias means mounted on and coaxial with said second shaft and engaging said second drive wheel to resiliently bias the face of said second drive wheel toward the face of said first drive wheel to provide a resilient gripping force between said drive wheels at said nip

whereby elongate objects of different diameters fed into said nip will be resiliently gripped by and pulled between said first and second drive wheels as said drive wheels are caused to rotate; and means threadedly mounted on said second shaft and engaging said bias means for adjusting said bias means to vary said gripping force at said nip.

4,534,500

SETTING DEVICE WITH A DRIVING PISTON PROPELLED BY HIGH PRESSURE GASES

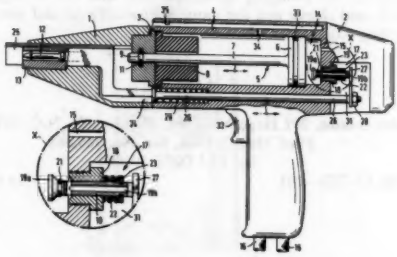
Peter Jochum, Meiningen, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Dec. 14, 1982, Ser. No. 449,821

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151658

Int. Cl.³ B27F *7/17*

U.S. Cl. 227—7 **6 Claims**



1. A setting device for inserting fastening members into a receiving material comprises wall means forming an axially extending working cylinder having a first end and a second end and with the axis thereof extending in the direction between the second end and the first end, a driving piston axially displaceably mounted within said working cylinder, said wall means forming an expansion chamber in communication with the second end of said working cylinder and arranged to receive a source of high pressure gases for displacing said driving piston axially through said working cylinder in the direction from the second end toward the first end thereof, and a vent valve opening directly into said expansion chamber and having a open position for connecting said expansion chamber to the

atmosphere and a closed position preventing flow of the gases out of said expansion chamber, wherein the improvement comprises that said setting device has an inactive position where it is incapable of inserting fastening members and an active position for inserting fastening members, in the inactive and active position said expansion chamber forms a volume with said vent valve in the open position corresponding to the inactive position of said setting device connecting said expansion chamber to the atmosphere, operating means located at least in part axially outwardly from the first end of said working cylinder and accessible on the exterior of said setting device and being displaceable in the axial direction of said working chamber toward the second end thereof for placing said vent valve in the closed position whereby said setting device is in the active position, said wall means comprises a front casing portion forming an opening for driving fastening members from said setting device, and a rear casing portion including said working cylinder, said first end of said working cylinder disposed in communication with said front casing portion, and said operating means includes a sensing element located within said wall means and extending outwardly from the opening from said setting device in the direction forming an extension of the axis of said working cylinder, a force accumulator is incorporated in said vent valve for biasing said vent valve into the closed position, a spring mounted in said wall means in operative engagement with said sensing element for biasing said sensing element in the direction outwardly from the opening from said setting device, and said sensing element being in contacting engagement with said vent valve for maintaining said vent valve in the open position with said spring overriding the biasing action of said force accumulator when said setting device is in the inactive position.

4,534,501

DEVICE FOR MARKING THE HEIGHT ABOVE THE FLOOR OF THE EDGES OF ARTICLES OF CLOTHING

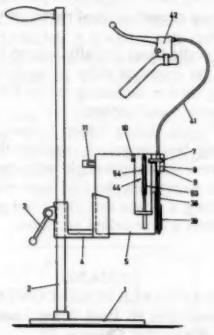
Harald Berns, Wuppertal, Fed. Rep. of Germany, assignor to Johann Knupp GmbH & Co., Solingen, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 357,240

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111259

Int. Cl.³ A41H *9/02*

U.S. Cl. 227—65 **24 Claims**



1. In a device for marking the height above the floor of the edges of articles of clothing, having a fabric deflector with a deflection slot and a longitudinal channel transverse to the deflection slot, and a fabric pressing lever which is movable into the deflection slot, the fabric pressing lever having an immersion end portion with a recess which is alignable with the longitudinal channel of the fabric deflector, wherein the improvement comprises

a pin magazine shaft extending transversely of said channel and communicating with said channel, and

a pin insertion ram movable in said channel, and

actuating means operatively engageable with said pin insertion ram for automatically actuating movement of said pin insertion ram,

a first movable carriage member supporting said pin insertion ram, said first movable carriage member having a release step,

said actuating means, comprising a force accumulator means for acting on said first movable carriage member and for accumulating force with which to move said pin insertion ram, for charging said force accumulator means upon a swinging-in movement of said fabric pressing lever and for operatively releasing said force accumulator means via said release step in an end phase of the swinging-in movement of said fabric pressing lever so as to move said pin insertion ram.

4,534,502

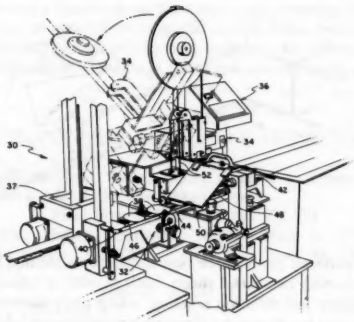
AUTOMATIC SOLDER MACHINE

Walter J. Plurek, Oxnard, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 14, 1983, Ser. No. 466,388

Int. Cl.³ H01L *35/34*

U.S. Cl. 228—102 **22 Claims**



1. Apparatus for applying at least one elongated conductor to a plurality of solar cells having first and second oppositely directed surface portions to establish electrical connection between the cells, comprising:

primary means for concurrently conveying the cells toward a preselected location at a first rate of speed and in a first spaced apart condition;

secondary means for conveying the cells from the preselected location at a second reduced rate of speed and in a second more closely spaced condition;

means for feeding at least one elongated conductor between each cell and a succeeding cell as they are conveyed from the preselected location, such that the conductor extends from the first surface portion of said cell to the second surface portion of the succeeding cell; and

means for soldering the conductor to said first and second surface portions at a second loaction downstream of said preselected location.

9. A method of applying at least one elongated conductor to a plurality of solar cells having first and second oppositely directed surface portions to establish electrical connection between the cells, comprising:

conveying the cells concurrently toward a preselected location at a first rate of speed and in a first spaced apart condition;

conveying the cells from the preselected location at a second reduced rate of speed and in a second more closely spaced condition;

feeding at least one elongated conductor between each cell and the succeeding cell as the cells are conveyed from the prese-

lected location, such that the conductor extends from the first surface portion of one cell to the second surface portion of the succeeding cell; and

soldering the conductor to said first and second surface portions at a second location downstream of the preselected location.

4,534,503

STIFFENED PANEL

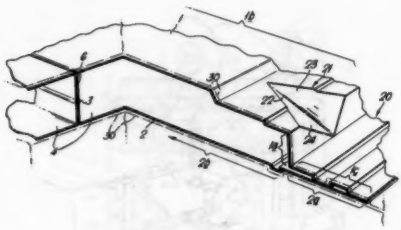
David Stephen; Martin H. Mansbridge, and Alan W. Highnam, all of Bristol, England, assignors to British Aerospace Public Limited Company, London, England

Filed Nov. 9, 1983, Ser. No. 550,213

Claims priority, application United Kingdom, Nov. 9, 1982, 8231913

Int. Cl.³ B23K *28/02*; B21D *26/02*

U.S. Cl. 228—157 **1 Claim**



1. A stiffened panel of the type formed by a method including subjecting two metal sheets, both capable of superplastic deformation and diffusion bonding, which are positioned face to face, to a bending and deforming process during which the sheets are joined to one another at a series of spaced substantially continous joint lines across their faces, and during which parts of said sheets between the joint lines are superplastically deformed in a mould to form a series of cavities between the two sheets, portions of said sheets on respective sides of a joint line being moved to form sidewalls of two neighbouring cavities, these sidewalls being urged to lie adjacent one another over substantial parts of their areas, so that they become diffusion bonded one to another to form a common sidewall of neighbouring cavities, and having formed spaced apart regions where the sheets have contacted opposite mould faces is further formed with an outer lip region in which an edge region of one sheet remains generally aligned with that spaced apart region which it forms, whilst an edge region of the other sheet is deformed out of alignment with that spaced apart region which it forms to lie, firstly, generally transverse to the spaced-apart regions and, secondly, to be generally aligned with, and be attached to, said edge region of said one sheet, said generally transverse deformed region being further formed with inset generally V-shaped regions, the sides and the base of each V-shape being formed from the spaced-apart region and the deformed region of said other sheet and sloping toward the spaced-apart region of said one sheet, said base of at least some of said V-shaped regions being coincident with at least some of said common side walls, and said lip region being stiffened by spaced bridging formations extending from that spaced-apart region of said one sheet to an edge region therof, the bridging formation, when viewed from the side, being of generally segmental shape.

4,534,504

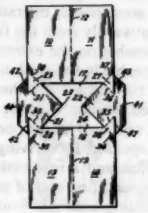
UNITARY CELLULAR PARTITION FOR CONTAINERS

Frank W. Locke, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Mar. 23, 1984, Ser. No. 592,891

Int. Cl.³ B65D *5/48*

U.S. Cl. 229—15 **6 Claims**



1. A cellular partition structure formed from a planar blank for erection and insertion into a rectilinear container comprising:

first and second partition walls constituting a first pair of partition walls hingedly connected to each other by a fold line constituting a hinged connection and third and fourth partition walls constituting a second pair of partition walls hingedly connected to each other by a fold line constituting a hinged connection, each pair of partition walls having an upper end and a lower end;

a first and a second connecting section constituting a pair of opposite longitudinal connecting sections which are between and join said lower ends of each pair of partition walls with said first connecting section joining said first and third partition walls and said second connecting section joining said second and fourth partition walls;

wherein said partition has an open-ended upper section adapted to receive a fragile device and a lower section to support the partition structure and prevent its rotation in the container, the lower section of the partition being defined by an opening in the blank at the lower end of each pair of connected partition walls and said opposite longitudinal connecting sections, which connecting sections are along each side of said opening, the lower ends of said fold lines of said pairs of partition walls touching said opening;

said pairs of walls being initially spaced from each other in the blank on opposite sides of said opening, each said connecting section including means for folding said pairs of walls toward each other;

each pair of walls, when folded toward the other pair of walls, being bent angularly around the respective fold lines to form a substantial angle with the adjacent partition wall of the pair when the fold lines meet; said fold lines meeting along a single axis along the center of said container to form a four-celled partition.

4,534,505

EXPANDABLE FOOD CONTAINER

James W. Montealegre, St. Paul, Minn., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 9, 1984, Ser. No. 569,450

Int. Cl.³ B65D *5/00*

U.S. Cl. 229—33 **1 Claim**

1. An expandable package for holding unpopped popcorn in an oven and which is readily openable and expandable for holding said popcorn after it has been popped, said package being pentagonal at the botom and hexagonal at the top and being formed from a unitary blank of foldable sheet material, such as paperboard, and comprising:

(a) an elongated pentagonal bottom wall panel having a plurality of side wall panels foldably joined to side edges

thereof, and to each other, and sloping upwardly and outwardly therefrom to present at the upper edges thereof a hexagonal configuration;

(b) said side wall panels including:

(i) three trapezoid shaped first panels foldably joined to three adjacent side edges of said bottom wall panel;

(ii) two parallelogram shaped second panels foldably joined to the remaining two side edges of said bottom wall panel;

(iii) said first and second panels defining five side wall panels which outline at the bottom thereof the pentagonal shape at the bottom of the package;

(c) one triangular shaped third panel foldably joined to a side edge of one of said second panels and forming a sixth side wall panel located between said second panels with one of the sides of said triangular-shaped third panel located at the top of said package to outline in combination with the top edges of said five side wall panels the hexagonal shape at the top of the package;

(d) six top closure panels foldably joined to upper edges of respective side wall panels and being folded over into overlapped relation to form a hexagonal shaped cover;

(e) certain of said closure panels being detachably secured with respect to each other, so that when popcorn in the package expands said closure flaps can separate from each other to form an open top receptacle.

4,534,506

THERMOPNEUMATIC MECHANISM FOR OPENING AND CLOSING A RADIATOR GRILLE

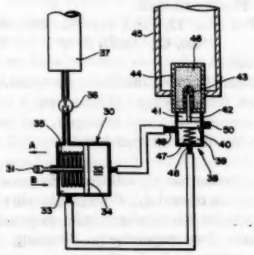
Keiichi Ishida; Junji Okumura, and Fumio Agetsuma, all of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Aug. 11, 1982, Ser. No. 407,301

Claims priority, application Japan, Aug. 13, 1981, 56-120343[U]; Aug. 13, 1981, 56-120345[U]; Aug. 13, 1981, 56-127286; Aug. 13, 1981, 56-127287

Int. Cl.³ F01P *7/12*

U.S. Cl. 236—35.3 **1 Claim**



1. A radiator grille actuating mechanism for use on an automobile having a body and a vacuum source, and utilizing an engine coolant, comprising:

a radiator grille pivotably mounted on the automobile body;

a link mechanism connected to said radiator grille;

an actuator, including a cylinder having a vacuum chamber, a pressure chamber and a piston slidably positioned in said cylinder between said chambers, said piston having a plunger pivotably connected to said link mechanism for opening and closing said grille by the movement of the piston, said piston being biased toward said pressure chamber for closing said grille and drawn toward said vacuum chamber against said bias for opening said grille, under application of the vacuum from said vacuum source;

means for controlling the reciprocations of said piston in said cylinder in response to changes in temperature of said engine coolant, said controlling means including change-over switch means and a temperature sensor for actuating said switch means, said switch means including means for venting said pressure chamber to atmosphere to open said grille under said bias in a first position of the switch means and means for connecting said pressure chamber to said vacuum chamber for closing said grille in a second position of said switch means, said temperature sensor comprising a wax-type thermostat having a portion extending into said engine coolant and containing a mass of wax having a fixed melting point and a rod extending into said mass of wax for moving said switch means between the first and second positions according to the expansion and contraction of said wax about said melting point.

4,534,507

AIR TEMPERATURE REGULATING APPARATUS FOR VEHICLES

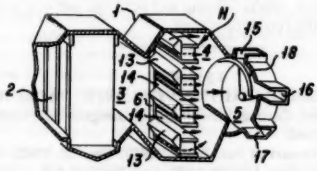
Tamotsu Matsuda, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1983, Ser. No. 471,470

Claims priority, application Japan, Mar. 3, 1982, 57-29757[U]; Mar. 18, 1982, 57-38223[U]; Mar. 18, 1982, 57-38224[U]

Int. Cl.³ G05D *23/00*

U.S. Cl. 237—12.3 A **4 Claims**



1. An air temperature regulating apparatus for a vehicle including a unit case mounted in a front portion of a body of a vehicle having a fore portion, a rear portion, an air-intake chamber formed in the fore portion, an air-intake window for intaking air to said air-intake chamber, a single mixing chamber formed in the rear portion, a heat exchanger mounted between said air-intake chamber and said mixing chamber, one air exit in said mixing chamber for blowing out low temperature air, and another air exit in said mixing chamber for blowing out high temperature air, said heat exchanger comprising:

a flattened empty pipe having both ends remaining round, the pipe being bent in a zig-zag shape with the flattened portions extending horizontally, plural air-heating passages and unfinned passages being alternately arranged and defined between said flattened portions,

plural heat-radiating fins mounted in said air-heating passages, said exchanger being designed such that the temperature of air which flows past one end air-heating passage

becomes gradually higher than the temperature of air which flows past opposite end air-heating passage and such that the surface area of said heat-radiating fins being mounted on said one end air-heating passage becomes gradually higher than the surface area of said heat-radiating fins being mounted in said opposite end air-heating passage, and

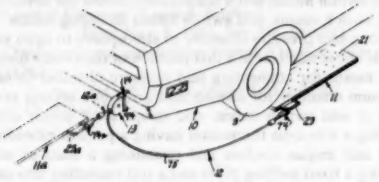
a damper mounted in front of said pipe variably adjustable to change an opening area of said air-heating passages.

4,534,508

ANTI-SKID DEVICE FOR VEHICLES

Lucas Willner, Jr., 14992 Kilbourne, Detroit, Mich. 48213

Filed Aug. 5, 1983, Ser. No. 520,607
Int. Cl.³ E01B *23/00*
U.S. Cl. 238—14 **9 Claims**



1. An anti-skid device for use with a vehicle ground engaging wheel, characterized in that it includes:

(a) an elongated traction pad having an end for wedging under the front end of a ground engaging wheel of a vehicle, and to allow production of traction on said pad upon rotation of said wheel onto the pad during a forward movement of the vehicle;

(b) a retractor means operatively mounted on the vehicle;

(c) said retractor means having a housing and including a cable coiled therein and adapted to have an outer end manually withdrawn therefrom and detachably connected to said pad; and,

(d) said retractor means including means for retracting said cable into the retractor means housing after said vehicle wheel has been moved onto the pad and over the same during a forward movement of the vehicle, the cable retracting means being operative to retract the cable into the retractor means housing and hold the pad in a position adjacent the retractor means.

4,534,509

MULTIPLE COMPARTMENT PLASTIC PACKING

Günter Holzner, Carouge, Switzerland, assignor to Firmenich SA, Switzerland

Continuation-in-part of Ser. No. 432,917, Sep. 28, 1982,. This application Jul. 20, 1983, Ser. No. 515,515
Int. Cl.³ B65D *81/32*
U.S. Cl. 239—34 **4 Claims**

1. A plastic packing for the storage and the delivery of active materials containing multiple compartments to accomodate liquid, solid or gel materials, said compartments being formed by the joinder of two flexible sheets of polymeric plastic materials, which packing is characterized in that it comprises:

at least one sealed storage compartment impervious to the active materials, and

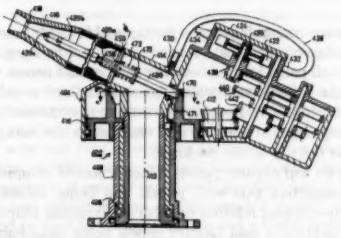
a sealed receiving compartment, said storage compartment being limited at its periphery by seams, at least one of which being constituted by a sheet of rupturable polymer plastic foam material which adheres on both its outer surfaces to leak-tight resilient polymeric plastic sheets, said seam rupturing internally within the foam material without rupture of the outer walls of the storage compartment when an external pressure is applied to one of the compartments to tear open said storage compartment and permit emptying of said active material into said receiving compartment without exposure of said material to the surrounding environment.

4,534,510

AREA PATTERN CONTROLLED SPRINKLER

Isaac Rinkewich, 12 Fishman Maimon St., Tel-Aviv, Israel

Filed Mar. 29, 1984, Ser. No. 594,726
Claims priority, application Israel, Oct. 21, 1983, 70024
Int. Cl.³ B05B *3/04*
U.S. Cl. 239—97 **18 Claims**



1. A water sprinkler comprising a housing having an inlet connectible to a pressurized water supply line; a nozzle carried by said housing and angularly displaceable about a vertical axis; a drive driven by the energy of the water in the pressurized water supply line for angularly displacing said nozzle about said vertical axis; a plunger movable to restrict and enlarge said nozzle; and a cam member effective during the angular displacement of the nozzle about said vertical axis, to control the displacement of said plunger so as to produce a water distribution pattern of predetermined configuration around the sprinkler.

4,534,511

FLOCKING APPARATUS

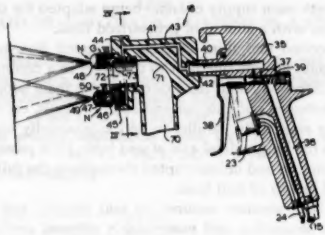
Hack A. Sullivan, Hammond, Ind., assignor to Sullivan Mfg. & Sales Corp., Hammond, Ind.

Filed May 13, 1983, Ser. No. 494,458
Int. Cl.³ B05B *7/14*
U.S. Cl. 239—336 **22 Claims**

1. An improved flocking machine comprising a handgun having a portion for applying a flock spray, a source of pressurized liquid connected to said handgun, and means for positively feeding dry flock to said handgun, the improvement comprises:

said sprayer portion having a linearly directed flock nozzle for the emission of said dry flock, a plurality of adjustable atomizer nozzles circumferentially disposed about said flock nozzle for respectively directing liquid spray streams in patterns which substantially circumferentially engulf said dry flock emitted from said flock nozzle and which intersect with one another at a point outward and

aligned with said flock nozzle, and a lip extending radially into the top of a discharging opening of said flock nozzle



and eccentrically disposed between opposed side edges of said flock nozzle along the top of the discharge opening.

4,534,512

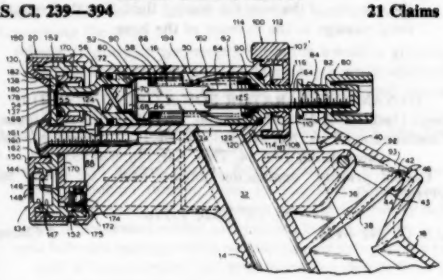
FLUID DISPENSER

Ho Chow, River Edge, and Sidney J. Goodman, Paramus, both of N.J., assignors to Melnor Industries, Inc., Moonachie, N.J.

Filed Mar. 21, 1983, Ser. No. 476,997

Int. Cl.[3] B05B *1/12, 1/16*

U.S. Cl. 239—394 **21 Claims**



1. A fluid dispenser having capabilities for no flow and first and second spray shapes comprising:

(A) a dispenser body defining a fluid inlet, a fluid outlet, and an internal passage for a fluid stream, said passage being in fluid communication with said inlet and outlet and defining a wide chamber, a narrow chamber and a valve seat, said valve seat being disposed intermediate said wide and narrow chambers and tapering from the diameter of said wide chamber to the diameter of said narrow chamber;

(B) a piston having spray shaping means and valve body means, said piston being movable among no flow and first and second solid spray shape positions,

(1) in said no flow position said valve body means engaging said valve seat to block flow through said passage and said spray shaping means being in said narrow chamber;

(2) in said first spray shape position said valve body means being spaced from said valve seat and said spray shaping means being disposed in said narrow chamber; and

(3) in said second spray shape position said valve body means being spaced from said valve seat and said spray shaping means being disposed in said wide chamber; and

(C) means operatively connected to said piston for moving said piston among said positions.

4,534,513

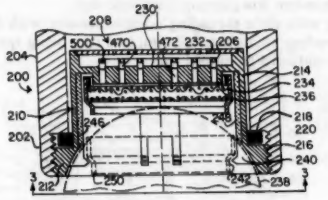
CONCEALED AERATOR

Elie P. Aghnides, Hotel Pierre, 795 Fifth Ave., New York, N.Y. 10021

Filed Jan. 13, 1983, Ser. No. 457,775

Int. Cl.[3] E03C *1/084*

U.S. Cl. 239—428.5 **38 Claims**



1. An improved aerator for insertion into a spout through which water flows, the spout having (a) a downstream pipe portion with female threading along the inner surface thereof, the smallest diameter of the female threading being d_1; (b) an upstream pipe portion which (i) has a common longitudinal axis with and is axially adjacent to the downstream pipe portion and (ii) has an inner diameter d_2 which is less than d_1; and (c) an annular surface extending between the inner surface of the upstream pipe portion and the inner surface of the downstream pipe portion, the improved aerator comprising:

a tubular element including (a) a first tubular length having standard male threading therearound which is complementary with the female threading along the inner surface of the downstream pipe portion of the spout, the diameter of the threaded first length being substantially equal to d_1; (b) an unthreaded second tubular length which shares a common longitudinal axis with and is axially adjacent to the first length of the tubular element and has an outer diameter d_3 which is less than d_2; and (c) an annular ledge extending between the outer wall of the second length and the outer wall of the first length;

an annular sealing element;

jet forming means for forming the flow of water into jets, the jet forming means being encircled by the tubular element;

wherein the second length of the tubular element fits within the upstream portion of the spout when the first length of the tubular element is screwed into the downstream portion of the spout;

wherein the annular sealing element comprises a sealing interface between the annular ledge of the tubular element and the annular surface of the spout when the aerator is screwed into the spout; and

wherein the aerator is at least partially concealed when the aerator is screwed into the spout.

4,534,514

CONCEALED AERATOR WHICH SEALS AGAINST A SPOUT WHEN INSERTED THEREIN

Elie P. Aghnides, Hotel Pierre, 795 Fifth Ave., New York, N.Y. 10021

Continuation-in-part of Ser. No. 457,775, Jan. 13, 1983,. This application Sep. 15, 1983, Ser. No. 532,289

Int. Cl.[3] E03C *1/08*

U.S. Cl. 239—428.5 **18 Claims**

1. An improved tubular aerator for insertion into a spout through which water flows, the spout having (a) a downstream pipe portion with standard female threading along the inner surface thereof, the smallest diameter of the female threading being d_1; (b) an upstream pipe portion which (i) has a common longitudinal axis with and is axially adjacent to the downstream pipe portion and (ii) has an inner diameter d_2 which is less than d_1; and (c) an annular shelf extending between the

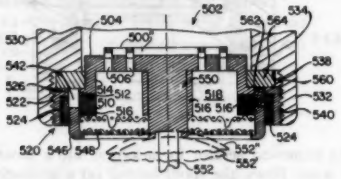
inner surface of the upstream pipe portion and the inner surface of the downstream pipe portion, the improved aerator comprising:

a disk of diameter less than d_2 having at least one aperture therein through which water can flow;

an annular rim extending radially outward from a downstream part of said disk;

a body portion extending downstream from said rim, said body portion having air inlets defined therein and defining a chamber downstream from said disk;

a ring with male threading complementary with the spout threading encircling said rim, said ring being spaced radially outward from said rim;



means for coupling said ring to said rim maintaining an air space therebetween which extends downstreawardly about said body portion around at least an arcuate length thereof, the air space defining a passageway for air into the chamber through the air inlets; and

means for producing a seal against the upstream surface of said rim and the upstream surface of said ring to close off the upstream end of the air space therebetween when the aerator is screwed into the spout;

said seal producing means acting to confine the flow of air and the flow of water into the chamber;

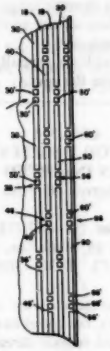
said disk at least partially extending up into the upstream pipe portion when the aerator is screwed into the spout, the aerator thereby being at least partially concealed.

4,534,515

DRIP IRRIGATION SYSTEM EMPLOYING ADJACENTLY ARRANGED FLOW-RESTRICTING PASSAGES

Richard D. Chapin, 368 N. Colorado Ave., Watertown, N.Y. 13601

Filed Apr. 1, 1982, Ser. No. 364,229
Int. Cl.³ A01G *25/02*
U.S. Cl. 239—542 **45 Claims**



1. For use in a fluid-distributing system for plants and the like, an elongated fluid-distributing hose having a longitudinal axis, said hose comprising:

an elongated, water-impervious planar material having longitudinally extending margins, said material folded upon itself to overlap said margins thus defining inner and outer margins, said outer margin defining a first exterior wall and said inner margin defining a second interior wall;

a discrete main supply channel being adapted for communication with a source of pressurized fluid;

first, second and third discrete elongated flow-restricting passages aligned one next to the other in a common plane and disposed about the exterior of the main supply channel between said interior end exterior walls, each passage being essentially parallel to and substantially equidistant from the longitudinal axis of said hose, each passage being continuous and uninterrupted throughout the full longitudinal length of said hose;

a first wall member secured to said interior and exterior walls separating said main supply channel and said first passage;

a second wall member secured to said interior and exterior walls separating said first and second passages;

a third wall member secured to said interior and exterior walls separating said second and third passages;

first fluid-passing stations in said first wall member for passing fluid directly from said discrete main supply channel passage to said first discrete passage;

second fluid-passing stations in said second wall member for passing fluid directly from said first discrete passage to said second discrete passage;

third fluid-passing stations in said third wall for passing fluid directly from said second discrete passage to said third discrete passage; and

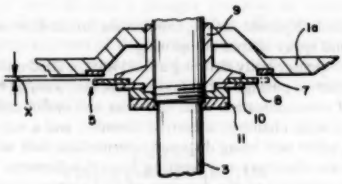
discharge fluid-passing stations from said third passages to the exterior of the hose for passing fluid directly from said third passage to the exterior of the hose.

4,534,516

DYNAMIC SEPARATOR FOR A GRINDING MILL

Iwao Hashizume, 11-1 Shinjyo-cho, Ibaragi-shi, Osaka, Japan

Continuation of Ser. No. 346,593, Feb. 8, 1982, abandoned. This application Jun. 14, 1984, Ser. No. 620,533
Claims priority, application Japan, Mar. 16, 1981, 56-37714[U]
Int. Cl.³ B02C *17/16*
U.S. Cl. 241—171 **2 Claims**



1. A grinding mill comprising a dispersive agitation tank and a dynamic separator, said dynamic separator comprising: a stator extending in a horizontal plane and fixed to a top wall of said agitation tank; and

a rotor extending in a horizontal plane and located vertically below said stator within said agitation tank and facing said stator with a small predetermined gap between a horizontally extending surface of the stator and a horizontally extending surface of the rotor in order to separate a dispension medium from a processed material, said rotor having a vertically extending axis of rotation and an outer periphery, wherein a horizontally extending radial distance from one point on said periphery to said axis of rotation is not equal to a horizontally extending radially distance from at least one other point on said periphery to

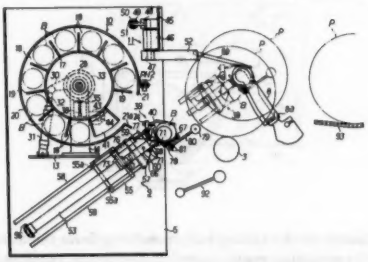
said axis of rotation, so that an overlap of a rim of said rotor relative to a rim of said stator varies constantly.

4,534,517

METHOD OF AUTOMATIC DOFFING IN A SPINNING UNIT

Shigeru Muramatsu, Okazaki; Isao Asai, Toyota, and Takayuki Morita, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Oct. 11, 1983, Ser. No. 540,492
Claims priority, application Japan, Oct. 13, 1982, 57-179480
Int. Cl.³ B65H *54/26, 67/04*
U.S. Cl. 242—35.5 A **11 Claims**



1. A method for automatically and substantially contemporaneously doffing a full-yarn package from, and donning an empty bobbin on the bobbin holder of a yarn spinning unit, comprising the steps of:

releasably grasping said empty bobbin in a bobbin grasping unit mounted on a bobbin loading device while said bobbin loading device is in a first position thereof spaced away from said bobbin holder;

opening said bobbin holder and thereby doffing said full-yarn package onto a support therebelow;

moving said bobbin loading device, carrying said grasped empty bobbin therein, from its said first position to a second position thereof wherein said carried empty bobbin is positioned within said opened bobbin holder;

said full-yarn package while on said support being within the path of movement of said bobbin loading device from its said first position to its said second position;

said bobbin loading device during said movement from its first position to its second position engaging and pushing said full-yarn package from said support onto a package delivery conveyor for conveying of said full-yarn package away from said bobbin holder;

closing said bobbin holder and releasing said empty bobbin from said bobbin grasping unit while said bobbin loading device is in its said second position, and thereby donning said empty bobbin on said bobbin holder;

and then moving said bobbin loading device from its said second position to its said first position.

4,534,518

AUTOMATIC LABEL WINDER

Tadao Kashiwaba, Kitakami, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Aug. 21, 1984, Ser. No. 642,830
Claims priority, application Japan, Aug. 24, 1983, 58-153161
Int. Cl.³ B23P *23/00*; B65H *19/20*
U.S. Cl. 242—56 R **23 Claims**

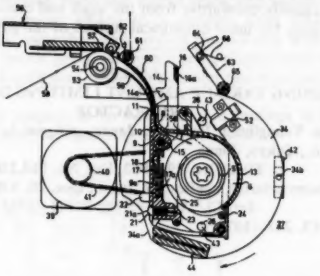
1. An automatic label web winder for automatically winding a label web having printing labels upon the take-up core of a label cassette, said winder comprising:

a rotatable turntable;

means for relasably securing a label cassette to said turntable in such manner that said label cassette rotates with said turntable when it is secured thereto;

means for guiding a label web into said cassette when said cassette is secured to said turntable;

means for rotating a take-up core of said cassette when said



cassette is secured to said turntable and after said label web has been guided into said cassette;

means for rotating said turntable after said label web has been wound about said core; and

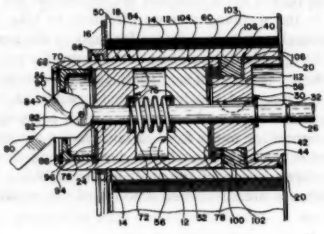
means responsive to said rotation of said turntable for cutting said label web.

4,534,519

PHOTOGRAPHIC PAPER ROLL CORE HOLDING DEVICE

Charles L. Euteneuer, St. Michael, and Robert E. Diesch, Rogers, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Feb. 8, 1983, Ser. No. 464,962
Int. Cl.³ B65H *19/02, 75/24*
U.S. Cl. 242—68.3 **10 Claims**



1. A holding device for securing a photographic paper roll core having an inner cylindrical surface concentrically about a rotatable shaft, the holding device comprising:

an annular shoulder portion fixed concentrically about the shaft;

a cylindrical compression sleeve positioned concentrically about the shaft and movable in an axial direction along the shaft;

a resilient clamping ring positioned concentrically about the shaft between the shoulder and the cylindrical compression sleeve;

cam actuated means for selectively urging the cylindrical compression sleeve toward the shoulder so that the resilient clamping ring is deformed from a first radially retracted position between the cylindrical compression sleeve and the shoulder into a second radially extended position in which the resilient clamping ring engages the inner cylindrical surface of the paper roll core to secure the paper roll core for rotation with the shaft;

spring bias means for transmitting the urging force from the cam actuated means to the cylindrical sleeve; and

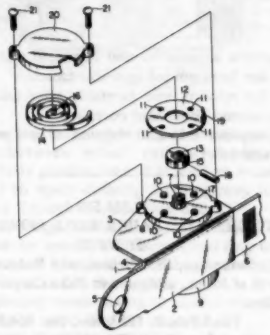
a friction reducing expansion ring between the resilient ring and the cylindrical compression sleeve and a friction reducing expansion ring between the resilient ring and the annular shoulder each of which expansion rings expands radially for uniformly permitting the resilient ring to move radially outwardly from the shaft and concentrically engage the inner cylindrical surface of the paper roll core.

4,534,520

WEBBING TAKE-UP AMOUNT LIMITING DEVICE OF A RETRACTOR

Hideo Yanagihara, Fujisawa, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,218
Claims priority, application Japan, Dec. 28, 1982, 57-195905
Int. Cl.³ A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107 **6 Claims**



1. In a webbing retractor having a webbing take-up shaft rotatably supported on a base and biasing means for biasing said shaft in the webbing take-up direction to take up said webbing around said shaft, a device for limiting the amount of webbing take-up, said device comprising means for preventing webbing take-up rotation of said shaft, said preventing means including an elongated flexible member connected between said base and said shaft and having means for tensioning said member in opposition to the force of said biasing means as said shaft rotates in the webbing take-up direction and thereby to prevent further rotation of the shaft in the webbing take-up direction when a predetermined amount of the webbing has been taken up.

4,534,521

INERTIA SENSOR IN BELT REELS FOR VEHICLE BELTS

Hans C. Sylvén, Reimers gata 10, S-447 00 VÅrgÅrda, Sweden

Continuation of Ser. No. 574,936, Jan. 27, 1984, abandoned, which is a continuation-in-part of Ser. No. 403,746, filed as PCT SE 81/00355 filed Feb. 7, 1981, published as WO 82/02000 Jun. 24, 1982 § 102(e) date Jul. 29 1982, abandoned. This application Sep. 13, 1984, Ser. No. 650,332
Claims priority, application Sweden, Dec. 8, 1980, 8008590
Int. Cl.³ B65H *75/48*
U.S. Cl. 242—107.4 A **7 Claims**

1. An inertia sensor in a belt reel for a vehicle belt for actuating a latch mechanism whether or not a bias means operatively connected with the sensor is functional, and functioning both as a passive and as an active sensor, comprising, in combination:

(a) a belt reel having a latch mechanism;

(b) a transmission element in the form of a double-arm lever with a first lever arm movable between an at-rest position and an actuating position, for operative interaction with the latch mechanism, to move it into a reel-latching position;

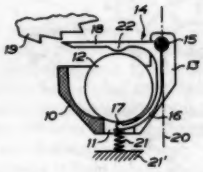
(c) a support for a rolling body;

(d) a rolling body carried on the support, normally in an at-rest position, and movable thereon between at-rest and lever arm-actuating positions;

(e) the double-arm lever being adjustable so that the first lever arm actuates the latch mechanism when the rolling body is in the actuating position;

(f) the lever extending around the rolling body in such a manner that a second lever arm engages and is retained by the lower side of the rolling body whenever the rolling body is in the at-rest position, and the first lever arm is positioned above the rolling body, with a lever arm fulcrum positioned therebetween;

(g) bias means biasing the first lever arm into the latch-actuating position whenever the second lever arm is released by the rolling ball, in moving from the at-rest into the actuating position, and in the at-rest position biasing the first lever arm into a position spaced from and above the rolling body, but still in a position to be engaged by the rolling body, in the event of nonfunctioning of the bias means, whenever the body moves from the at-rest to the actuating position;



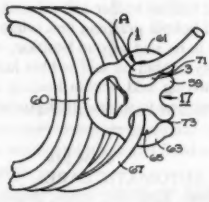
(h) the first lever arm whenever the bias means does not bias the first lever arm into the actuating position being engaged by the rolling body and moved by the rolling body into the latch-actuating position, whenever the body moves from the at-rest to the actuating position; whereby, whether or not the bias means is functional, upon movement of the rolling body from the at-rest into the actuating position the first lever arm is moved into a position in which it actuates the latch mechanism.

4,534,522

SPOOL RETAINING DEVICE

Robert L. Spence, 808 Birch Ave., Escondido, Calif. 92027

Filed Oct. 18, 1984, Ser. No. 662,032
Int. Cl.³ B65H *55/00*, *75/28*
U.S. Cl. 242—172 **4 Claims**



1. In combination with a spool having strand material wound thereon, a device for retaining the strand material intermediate the ends of the spool during unwinding of the strand material from the spool; said device comprising an element having two spaced apart apertures formed therethrough, each aperture larger than the strand material on said spool; an end of said strand material passing through one of said apertures, around said spool and through the other of said apertures, whereby the strand material extending from the other of said apertures diverges from the strand material extending through said one

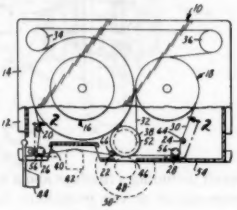
of said apertures during unwinding to maintain said element loosely adjacent the outer windings of said strand material on said spool and to allow said element to slip around said spool during unwinding.

4,534,523

TAPE GUIDANCE FOR BELT DRIVEN CARTRIDGE

Myron Zarr, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 29, 1984, Ser. No. 626,137
Int. Cl.[3] G03B *1/04;* G11B *15/32*
U.S. Cl. 242—192 **3 Claims**



1. In a tape cartridge of the type including walls defining an enclosure in which a magnetic tape is directed along a tape guidance path parallel to an edge of the cartridge for access by a magnetic transducer, the improvement comprising:

at least three tape guidance surfaces bearing against one or both major surfaces of said tape in a direction perpendicular to the plane of said tape;

each of said tape guidance surfaces including at least one enlarged shoulder extending from said tape guidance surface toward said tape to bear upon an edge of said tape and provide a containment force parallel to the plane of said tape and in a direction transverse to the direction of tape motion;

said shoulders of said tape guidance surfaces being arranged alternately along said tape path so that the shoulders of successive tape guidance surfaces bear against opposite edges of said tape; and

wherein the planes containing said shoulders are spaced a distance equal to or less than the width of said tape to ensure contact between all of said shoulders and said tape edges and positive confinement of said tape in said direction transverse to tape motion.

4,534,524

POSITION AND CONTROL SYSTEM FOR HELICOPTER BLADE ACTUATION

Allyn M. Aldrich, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 5, 1983, Ser. No. 539,119
Int. Cl.[3] B64C *27/605*
U.S. Cl. 244—17.25 **3 Claims**

1. A position and control mechanism for use in an aircraft comprising:

a hollow rotor shaft adapted to be journalled on a aircraft fuselage, to be driven by a prime mover, and mount, with provision for pitch adjustment, a plurality of blades;

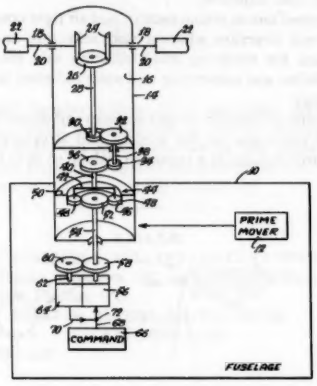
a plurality of bevel gears, one for each of said blades, rotatably mounted in said rotor shaft and adapted to controllably alter the pitch of the associated blade upon rotation relative to said rotor shaft, said bevel gears being connected to said blades and being rotatable with said rotor shaft;

at least one control shaft within said rotor shaft and rotatable relative thereto, said control shaft mounting a drive gear in engagement with at least one of said bevel gears for rotating the same upon rotation of said control shaft relative to said rotor shaft;

a planetary gear assembly including a ring gear, a sun gear, and at least one planet gear and associated carrier;

a speed change gear assembly within said rotor shaft including first, second, third and fourth gears, said second and third gears being affixed to a common shaft rotatable within said rotor shaft and meshed respectively with said first and fourth gears, said gears being dimensioned such that said fourth gear rotates at a greater rate than said first gear;

a drive unit adapted to be mounted on a fuselage in fixed relation thereon relative to said rotor shaft;



said sun gear being connected to said drive unit to be selectively driven thereby;

said ring gear being fixed to said rotor shaft to be driven thereby;

said carrier being connected to said first gear to drive the same;

said fourth gear being connected to said control shaft;

said gear assemblies being constructed and arranged such that when said sun gear is not being driven by said drive unit, said control shaft will rotate in the same direction and the same rate as said rotor shaft and when said sun gear is being driven by said drive unit, said control shaft will rotate relative to said rotor shaft to controllably alter the pitch of at least one of said blades.

4,534,525

EVACUATED BALLOON FOR SOLAR ENERGY COLLECTION

Emmanuel E. Bliamptis, 20 Phinney Rd., Lexington, Mass. 02173

Continuation-in-part of Ser. No. 372,859, Apr. 28, 1982, abandoned, which is a continuation of Ser. No. 171,612, Jul. 23, 1980, abandoned. This application May 10, 1983, Ser. No. 493,386
Int. Cl.[3] B64B *1/58;* B64D *27/24*
U.S. Cl. 244—30 **3 Claims**

1. An evacuated balloon-like device for solar energy collection and microwave energy transmission, said balloon comprising:

a hollow, substantially cylindrically-shaped structure having hemispherically-shaped end caps, said structure having rigid means and inflatable means within the interior thereof for maintaining said cylindrical shape of said structure, and a plurality of substantially air tight compartments;

said inflatable means for maintaining said substantially cylindrical shape of said structure including a plurality of

spaced apart inflatable strut rings, each of said strut rings having a plurality of inflatable elements, and wherein said inflatable strut rings are capable of being inflated as said structure is evacuated;

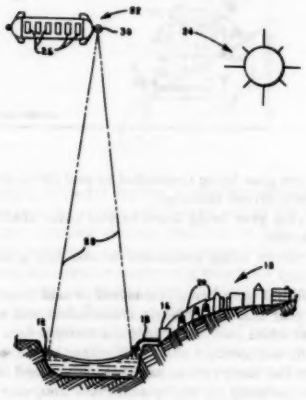
said rigid means including an elongated, hollow, cylindrical longitudinally extending beam;

means within said structure for evacuating air from said interior of said structure and for utilizing said evacuated air for guiding and stabilizing said structure;

means forming a portion of said structure for allowing solar radiation to pass therethrough and enter said interior of said structure, and means formed within another portion of said interior of said structure for reflecting and focusing said solar radiation;

solar panel means within each of said air tight compartments of said structure adjacent said reflecting and focusing means for receiving and collecting said focused solar radiation and converting said solar radiation to electrical energy;

a plurality of exterior control surfaces and means for passing said evacuated air for guiding said structure over said control surfaces in a regulated fashion so as to control the



movement of said structure based upon Bernoulli's principle;

means within said structure for receiving said electrical energy and converting said electrical energy to microwave energy, and means operably associated with said structure for transmitting said microwave energy;

means within said structure for receiving said electrical energy and using said electrical energy to operate said evacuating means so as to maintain said evacuation of said structure at a pressure that positions said structure at an altitude of substantial windlessness of approximately 30 km and whereat untethered structure positioning at a fixed relationship to ground can be maintained within minimum effort; and

means within said structure for distributing a substantial portion of said electrical energy to set electrical energy receiving and converting means and distributing a lesser portion of said electrical energy to said electrical energy receiving and using means;

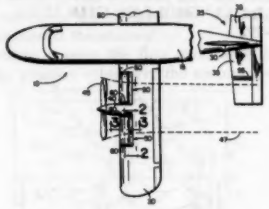
whereby said balloon provides a self-contained apparatus for efficiently converting solar energy to a readily usable form of energy.

4,534,526

CABIN NOISE SUPPRESSION IN PROPELLER DRIVEN AIRCRAFT

Frederick B. Metzger, Simsbury, and Bernard Magliozzi, West Suffield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1982, Ser. No. 453,199
Int. Cl.³ B64C *1/26, 1/40, 3/00*
U.S. Cl. 244—38 **7 Claims**



1. In an aircraft including a fuselage and a wing and powered by one or more engine driven propellers each establishing a wake downstream thereof, said wake impinging on said aircraft wing, the improvement characterized by:

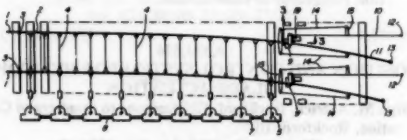
said wing being provided at the outer surface thereof with vibration isolating means disposed between said fuselage and the location of impingement of said propeller wake with said wing, said vibration isolating means including first and second elongate portions extending generally parallel to the boundary of said wake and a third portion connecting said first and second portions and oriented generally perpendicular thereto, thereby isolating said location from said fuselage for minimizing the propagation of vibration from said wake to said fuselage through said wing.

4,534,527

ALL WEATHER SWITCH FOR RAILROADS

Lawrence A. J. van Eyken, Kingston, and Semion Perlin, Willowdale, both of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jan. 30, 1984, Ser. No. 575,407
Int. Cl.³ E01B *7/02*
U.S. Cl. 246—445 **7 Claims**



1. A stub switch construction comprising:

(a) a pair of fixed longitudinally extending parallel, spaced straight through rails;

(b) a pair of fixed longitudinally extending parallel spaced turnout rails;

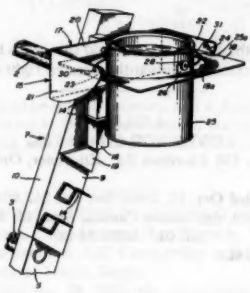
(c) a pair of longitudinally extending parallel spaced switch rails movable at one end thereof between a first position in axial alignment with said longitudinally extending straight through rails and a second position in axial alignment with said longitudinally extending turn out rails; and

(d) a pair of radius arms extending, on opposed sides of each of said switch rails, from a selected attachment point thereon to a selected attachment point on opposed sides of said straight through and turnout rails respectively, to thereby transmit axial rail tension and compression forces through said switch.

4,534,528
PAINT CAN HOLDER

Michel Rousseau, 795, Place Matte, Saint-Tite, Canada G0X 3H0

Filed Jan. 27, 1984, Ser. No. 574,529
Int. Cl.[3] E06C 7/14
U.S. Cl. 248—210 2 Claims



1. A device for supporting a cylindrical can on a ladder having a plurality of rungs between side rails, said can being of the type having a handle and a pair of rounded, diametrically-disposed handle-anchoring supports laterally protruding from said can near the top open end thereof, said device comprising a hook member adapted to be installed over a portion of one of said side rails, said hook member comprising an interior flange and an exterior flange adapted to extend respectively on either side of one of said side rails, and a transverse web joining laterally said interior and exterior flanges, a hook-shaped slot formed in said interior flange and adapted to engage one of said rungs, a can-supporting plate, support means carried by, and protruding from, said exterior flange and supporting said plate in a generally horizontal position when said hook member is installed on one of said rails, said can-supporting plate having an elongated aperture, of a length longer than the diameter of said can and of a width to have a close fit with one such can inserted through said aperture, a pair of spaced brackets upstanding from and respectively secured to said plate on each side of and contiguous to said aperture, each bracket having a semi-circular notch at its top edge, said notches being joined by a straight line transverse to the mid-length of said elongated aperture and normal to said exterior flange, said aperture adapted to receive said can to a level where said handle-anchoring supports seat in said notches and said handle rests on said plate, whereby said can may automatically pivot under gravity in said notches about said handle-anchoring supports to stay level despite varying ladder inclinations in a plane transverse to the plane containing said rails.

4,534,529
SHELF BRACKET AND COOPERABLE LOCKING BRACKET RETAINER

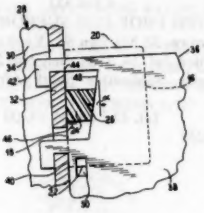
Steven C. Dorner, 5322 Fair Elms Ave., Western Springs, Ill. 60558

Filed Jun. 13, 1983, Ser. No. 503,668
Int. Cl.[3] F16L 3/08
U.S. Cl. 248—222.1 5 Claims

1. In combination, a support bracket and a bracket retainer for mounting on a vertical wall structure which includes a member having an inner surface and a plurality of spaced slots therethrough,

said bracket comprising a support member for supporting an article thereon, a proximal end, a distal end, a pair of L-shaped projections extending from said proximal end for hooking through respective ones of slots, each of said projections including an edge facing said distal end, and means defining a recess in said bracket including a locking edge extending at a downwardly convergent angle with respect to said proximal end, and

said bracket retainer comprising at least one first member plate for engaging the wall structure including an end, and

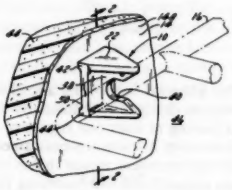


a second member connected to said plate including a locking surface complemental to and for engaging said locking edge, and effective to wedge said edges of said L-shaped projections against the inner surface of the wall structure in response to a tap on said end.

4,534,530
SUPPORT ASSEMBLY AND APPARATUS USING SAME

Arthur J. Danko, Oaklawn, Ill., assignor to Phillips Plastics Corporation, Phillips, Wis.

Filed Mar. 19, 1984, Ser. No. 591,166
Int. Cl.[3] A47G 29/02
U.S. Cl. 248—239 7 Claims



1. In combination:

a panel having a hole therethrough and having a front side and an opposite rear side;

and a support assembly for engaging an object to be associated with said front side of said panel and including a grommet member formed of relatively resilient plastic and a support member formed of relatively non-resilient plastic, said grommet member having a bore therein extending inwardly from said front side of said panel and closed at its other end,

and said support member being mounted in said bore and engageable with said object;

said grommet member being releasably mounted by insertion into said hole from said front side of said panel and having portions extending from said hole on the front and rear sides of said panel;

the portion of said grommet member extending on said front side of said panel comprising a resiliently deformable flange disposed on said front side of said panel and engaged therewith to effect a sealed relationship of said grommet member with said edge of said hole;

said grommet member further comprising resilient locking projections disposed on said rear side of said panel and releasably engaged therewith to effect releasable mounting of said grommet member in said hole and to effect resilient deformation of said deformable flange;

said support member including a serrated rigid shank remov-

ably inserted into said blind bore in said grommet member and having a support portion extending from said front side of said panel for engagement with said object and including a rigid flange engageable with said front side to transfer a load thereto.

4,534,531

ELONGATED PROP FOR SUPPORTING A LOAD

Allan H. G. Brown, 35 Marilyn St., Klerksdorp, South Africa

Filed Jul. 14, 1981, Ser. No. 283,157

Claims priority, application South Africa, Jul. 22, 1980, 80/4400

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—351 **6 Claims**

1. An elongated prop for supporting a load applied longitudinally comprising an elongated substantially cylindrical solid support member having at least one region of reduced cross-sectional area formed in it when unconstrained, and substantially cylindrical reinforcement means that is shorter than the prop and that has insignificant load carrying properties in the longitudinal direction and that encircles the support member over at least part of the region of reduced cross-sectional area, there being at least one void in the support member and surrounded by the reinforcement means into which the support member can collapse under load, the arrangement of the reinforcement means on the support member being such that, in use, the load will be applied to the end faces of the support member, the reinforcement means being spaced from both ends of the prop and therefore subject substantially to radial forces only without bearing any substantial part of the vertical load.

4,534,532

SECTION-MEMBER FOR A SLIDEWAY FOR CORRECTING THE ORIENTATION OF A SEAT, ITS METHOD OF MANUFACTURE AND THE SLIDEWAY COMPRISING SAID SECTION-MEMBER

Roger Parizet, Bonnee, France, assignor to Compagnie Industrielle De Mecanismes en abrege C.I.M., France

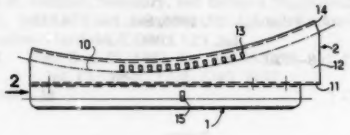
Filed Oct. 28, 1981, Ser. No. 315,785

Claims priority, application France, Nov. 5, 1980, 80 23569

Int. Cl.³ A47G *29/00*

U.S. Cl. 248—371 **1 Claim**

1. A section-member for correcting the orientation of a seat, and in particular a vehicle seat, having a generally U-shaped cross-sectional configuration, the section-member comprising a generally diabolo-shaped planar blank having opposed lateral regions thereof folded along parallel fold lines to form a web having a constant width and two side walls defining at least one curved upwardly open guideway, said web being planar, at least one of said side walls being provided with a series of openings having a general orientation perpendicular to the



curved axis of the guideway, and said side walls terminating in longitudinally extending inwardly directed right angle flanges.

4,534,533

COVER FOR CHAIR LEG

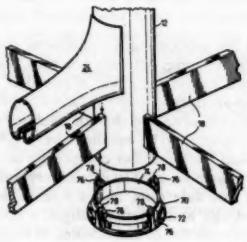
Frank Doerner, 138 Aberdeen Rd., Kitchener, Ontario, Canada N2M 2Y7

Filed Oct. 17, 1983, Ser. No. 542,401

Claims priority, application Canada, Mar. 15, 1983, 423610

Int. Cl.³ A47B *95/00*

U.S. Cl. 248—345.1 **38 Claims**



1. A covering means adapted to cover and be retained on legs of a chair, said covering means comprising a plurality of covers, each cover comprising a cover portion adapted to surround and cover a leg, said cover portion having a top inner surface, a first end portion adapted to cover the free end of the leg, a second end portion adapted to cover the opposite end of the leg, spacing means adapted to space said cover portion from the top surface of said leg, retaining means adapted to releasably retain said cover to said leg, and a retaining ring adapted to retain the second ends of all of the covers in the desired position.

4,534,534

FASTENING ARRANGEMENT FOR A MOTOR VEHICLE SEAT INCLUDING A SEAT ADJUSTING DEVICE

Peter Hess; Volkmar Schülz, both of Coburg, and Hans Rampel, Ahorn, all of Fed. Rep. of Germany, assignors to Metallwerk Max Brose GmbH & Co., Coburg, Fed. Rep. of Germany

Continuation of Ser. No. 140,614, Apr. 15, 1980,. This application Jan. 31, 1983, Ser. No. 462,457

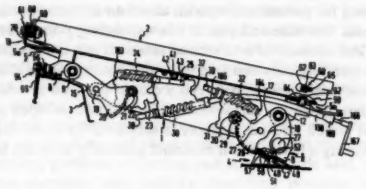
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2916562

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—424 **45 Claims**

1. A seat mounting arrangement for use in a motor vehicle having a travel direction and comprising a motor vehicle floor, a seat adjusting device having a lower frame arranged to be fastened to said motor vehicle floor at the front and rear thereof in the vehicle travel direction, wherein the improvement comprises that said motor vehicle floor includes a front cross member and a rear cross member, said lower frame includes a pair of laterally spaced struts extending between the front and rear thereof, each said strut having a lug at one end

thereof, one of said cross members having a plate secured thereto corresponding to each said lug and forming a wedge-shaped recess, each said lug on said struts arranged to engage



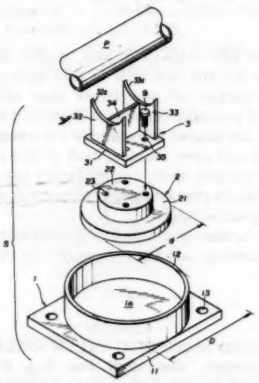
in one of said wedge-shaped recesses, and a threaded connecting member located at the opposite ends of said struts from said lugs for securing said struts to the other said cross member.

4,534,535

DAMPING SUPPORT FOR PIPING SYSTEM

Katsutoshi Maeda, Chigasaki, and Ikuo Shimoda, Fujisawa, both of Japan, assignors to JGC Corporation and Oiles Industry Co., Ltd., both of Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 426,907
Claims priority, application Japan, Oct. 2, 1981, 56-156177
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—636 **19 Claims**



1. A damping support for a piping system, said damping support comprising:

(a) a fixed base having a recess portion defined by a cylindrical enclosure, said recess portion having a planar upper surface;

(b) a movable disc-like member disposed within said recess portion, said movable disc-like member having a planar lower surface which is parallel to the planar upper surface of said recess portion and being sized so that it is movable horizontally in all directions within said recess portion;

(c) first means for attaching said movable disc-like member to a pipe;

(d) second means for spacing the planar lower surface of said movable disc-like member from the planar upper surface of said recess portion by an extremely small gap; and

(e) a viscous material disposed in said recess portion and at least substantially filling the gap between the planar lower surface of said movable disc-like member and planar upper surface of said recess portion,

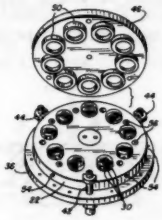
(f) the height of said extremely small gap and the viscosity of said viscous material being such that horizontal movement of the pipe transmitted to said movable disc-like member by said first means is damped by a viscous shearing resistance force generated by said viscous material in said extremely small gap between the planar lower surface of said movable disc-like member and the planar upper surface of said recess portion.

4,534,536

APPARATUS FOR MOUNTING SAMPLES FOR POLISHING

James A. Nelson, Mundelein, and Robert E. Zimmer, Niles, both of Ill., assignors to Buehler Ltd., Lake Bluff, Ill.

Filed Jun. 8, 1984, Ser. No. 618,476
Int. Cl.³ B29C *1/00*; B29D *3/00*
U.S. Cl. 249—83 **12 Claims**



1. Apparatus for preparing specimens for microscopic examination including means for mounting the specimens in a plastic mount and fixturing the mounted specimens for polishing by a polishing machine, the improvement comprising, in combination, a sample holder including plate means having a plurality of openings extending therethrough, a mold base member; and a mold top member including plate means having a plurality of openings therethrough corresponding to the location of said sample holder openings; said base, sample holder and top being adapted for combination in a stacked assembly with said sample holder positioned between said base and top and with the openings in said top and sample holder is alignment to form individual mold cavities.

4,534,537

PILOT OPERATED VALVE ASSEMBLY

Keith E. Zukausky, St. Charles, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 282,970, Jul. 13, 1981, Pat. No. 4,387,878.
This application Jun. 14, 1983, Ser. No. 504,258
The portion of the term of this patent subsequent to Jun. 14, 2000, has been disclaimed.
Int. Cl.³ F16K *31/04, 31/40*
U.S. Cl. 251—30.03 **11 Claims**

1. A pilot-operated valve having a relatively simply molded plastic diaphragm insert, the pilot-operated valve comprising:

(a) a valve housing which defines a fluid inlet in fluid communication with an annular inlet cavity, a valve seat generally central in the annular inlet cavity, and a fluid outlet extending through the valve seat;

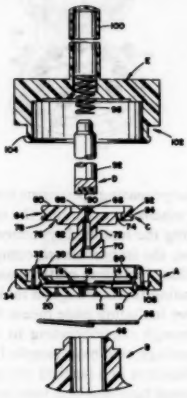
(b) a flexible diaphragm having an annular seating portion disposed in a fluid sealing relationship with the valve housing surrounding the annular inlet cavity, a flexible web portion extending peripherally inward from the annular seating portion for permitting movement of the diaphragm relative to the valve housing, a diaphragm peripheral portion disposed peripherally inward from the web portion for mechanically engaging the diaphragm insert, and a diaphragm central portion disposed radially inward from the diaphragm peripheral portion, the diaphragm central portion (i) having a first side which is disposed for selectively contacting the valve seat to form a sealing relationship therewith, (ii) defining a plurality of filtering apertures therethrough adjacent the diaphragm peripheral

portion in fluid communication with the annular inlet cavity, and (iii) defining a central aperture therethrough in fluid communication with the fluid outlet;

(c) the diaphragm insert having a first side, an oppositely disposed second side which is disposed adjacent the diaphragm central portion, and a peripheral edge disposed peripherally around the diaphragm insert between the first and second sides and in firm frictional contact with said diaphragm peripheral portion, the insert defining:

(i) a pilot outlet aperture centrally therethrough in communication with the diaphragm central aperture and the valve outlet,

(ii) a peripheral recess extending inward from both the insert peripheral edge and the insert second side such that the peripheral recess is moldable by a radially inward projection of a split mold block which is adapted to move generally parallel with the first and second insert sides, the insert peripheral recess being



disposed in alignment and fluid communication with the diaphragm filtering apertures for conveying filtered fluid therefrom,

(iii) a pilot supply aperture extending therethrough between the first side and the peripheral recess such that the peripheral recess is in fluid communication with both the pilot inlet aperture and the diaphragm filter apertures, whereby the peripheral recess provides fluid communication between the filter apertures and the pilot aperture without complex, multipiece molding arrangements;

(d) means operatively connected with the diaphragm annular seating portion for defining a pilot reservoir in fluid communication with the pilot inlet and outlet apertures; and,

(e) pilot valve means operatively connected with the pilot outlet aperture for selectively opening and closing the pilot outlet aperture.

4,534,538

MODULAR AIR SHUT-OFF VALVE

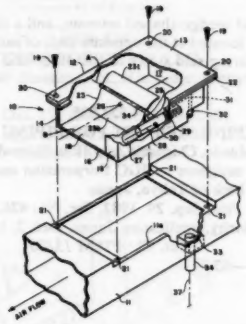
John J. Buckley, Baltimore, and William T. Scott, Ellicott City, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 8, 1983, Ser. No. 512,083
Int. Cl.³ F16K *31/143*
U.S. Cl. 251—62 **8 Claims**

1. A modular air shut-off valve configured for insertion into an air conditioning duct, comprising:

a. a housing, including first and second pairs of confronting sidewalls, said housing sized for insertion into said air conditioning duct, said walls defining an inlet and an outlet at respective ends of said housing and a passageway of substantially rectangular cross section for passage of air through said housing;

b. a vane mounted between said first confronting sidewall pair for pivotal movement, about an axis intersecting each said first sidewall pair at corresponding points between a first sidewall of said second sidewall pair and a center line extending between said inlet and outlet and defined along said passageway, between a closed position at which said passageway is substantially blocked and an open position at which said passageway is substantially open, said vane having a first portion mounted generally between said axis



and said first sidewall of said second sidewall pair for rotation toward said inlet in said open position, and a second portion of area larger than said first portion mounted generally between said axis and the second sidewall of said second sidewall pair for rotation toward said outlet in said open position, each of said portions having flexible margins along corresponding edges of said vane for resiliently contacting said second sidewall pair in said closed position; and

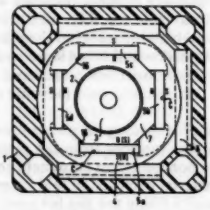
c. pressure actuating means connected to said vane for selectively pivoting said vane between said open and closed positions.

4,534,539

PULSED MAGNETIC VALVE ASSEMBLY

Heinrich Dettmann, Niedernhall, Fed. Rep. of Germany, assignor to Bürkert GmbH, Fed. Rep. of Germany

Filed Aug. 18, 1983, Ser. No. 524,301
Claims priority, application European Pat. Off., Aug. 20, 1982, 82107641.1
Int. Cl.³ F16K *31/08*
U.S. Cl. 251—65 **3 Claims**



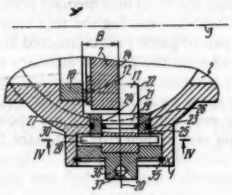
1. A pulsed magnetic valve assembly having permanent magnet support means with constant remanence comprising: valve means adapted to be electromagnetically operated and comprising a closure member; electromagnetically means for

operating said valve means, said electromagnetic means including a movable core member associated with said closure member and a ferromagnetic circuit; permanent magnet means produced from a rare earth/cobalt alloy forming part of said ferromagnetic circuit; a tubular core guide member for guiding said movable core member; and a stopper member for limiting movement of said movable core member in one direction; said ferromagnetic circuit including sheet metal sheets forming an outer part of said ferromagnetic circuit with said movable core member forming an inner part of said ferromagnetic circuit; trip and drop coil means surrounding said guide member and generally enclosed by said sheet metal sheets; said sheet metal sheets having portions extending radially towards said movable core member, said radially extending portions being shaped to define cutouts located in a generally annular configuration around one end of said tubular core guide member, with said permanent magnet means being inserted into siad cutouts in contact with said radially extending portions in a manner to extend around said one end of said tubular core guide member in a generally annular configuration whereby the core member can be secured in a switched position by said permanent magnet means.

4,534,540
GATE VALVE

Boris F. Bragin; Alexandr S. Kolomiets; Jury B. Korotkikh; Felix D. Markuntovich, all of Voroshilovgrad; Evgeny P. Olofinsky, Moscow; Petr V. Gladky, Kiev; Evgeny F. Perepletchikov, Kievskaya oblast, and Boris Y. Ekber, Moscow, all of U.S.S.R., assignors to Voroshilovgradsky Mashinostroitelny Institut, Voroshilovgrad, U.S.S.R.

Filed Jan. 13, 1984, Ser. No. 570,449
Int. Cl.[3] F16K *25/00*
U.S. Cl. 251—203 **6 Claims**

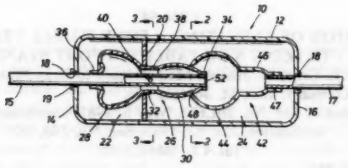


1. A gate valve comprising:
a casing;
a passageway defined in said casing having a centerline;
a valve seat mounted in said casing substantially coaxially with the centerline of said passageway;
a gate mounted in said casing for reciprocating movement into and out of cooperating engagement with said valve seat to close and open said passageway, respectively;
drive means operatively connected to said gate to impart said reciprocating movement to said gate;
at least one tapered face in the surface of said gate on the side thereof opposite that facing said valve seat and tapering in the direction of said reciprocating movement toward the closing position;
at least one stop member mounted in said casing having a flat surface facing and engageable with said at least one tapered surface when said gate is in the closed position;
at least one sleeve member rotatably mounted in a wall of said casing for relative rotation with respect thereto, said sleeve member having an inner surface with a longitudinal centerline extending transversely through the centerline of said passageway and an outer surface having a centerline extending eccentrically with respect to the centerline of the inner surface;
a rod member rotatably mounted in said inner surface for rotation about an axis extending coaxially with said centerline of said inner surface and having an end face facing toward the centerline of said passageway, said stop being rigidly secured to at least a part of said end face;
said flat surface of said stop lying in a plane including the axis of rotation of said rod member;
means to allow limited rotation of said rod member about its axis of rotation;
means to selectively rotate said sleeve member to adjust the distance between said flat surface on said valve seat; and
means to fix the position of said sleeve member against spontaneous rotation thereof.

4,534,541
VALVE INCORPORATING DEFORMABLE VALVE BODY

David P. Summers, Houston, Tex., assignor to Forerank, Inc., Houston, Tex.

Filed Dec. 19, 1983, Ser. No. 563,120
Int. Cl.[4] F16K *7/02, 7/18*
U.S. Cl. 251—331 **7 Claims**

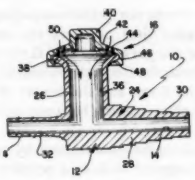


1. A valve apparatus comprising:
(a) a valve housing;
(b) a deformable valve body supported within said valve housing oppositely facing a valve seat for sealing engagement therewith, said valve body including first and second premolded spheroids joined by a connecting collar;
(c) an inlet pipe extending into said valve body, said valve body being mounted about said inlet pipe and having a forward end attached about a leading end of said inlet pipe;
(d) an outlet pipe connected to said valve seat;
(e) a partition wall dividing said valve housing into two chambers, one of said chambers being a fluid chamber, said valve body extending through a hole formed in said partition wall and sealingly engaged by said partition wall about said connecting collar; and
(f) opening means in said valve body for permitting fluid flowing through said inlet pipe to enter said fluid chamber.

4,534,542
SUCTION CONTROL DEVICE FOR ASPIRATOR SYSTEM

Ronald D. Russo, Barrington, R.I., assignor to Superior Plastic Products Corp., Cumberland, R.I.

Filed Dec. 5, 1983, Ser. No. 558,575
Int. Cl.[3] A61M *1/00*
U.S. Cl. 251—342 **8 Claims**



1. A suction control device comprising a body having a main portion and an outwardly extending chimney portion, and a

closure cap on said chimney portion, said main portion having a lumen therethrough, said chimney portion having a terminal end and having a passage therethrough which extends from said lumen to said terminal end, said terminal end having an annular closure surface thereon which extends outwardly from around the periphery of said passage, said closure cap being received on said terminal end and comprising an imperforate raised button portion and an annular rim portion which extends outwardly from said button portion, said rim portion having at least one aperture therethrough, said at least one aperture being disposed outwardly which respect to said passage, said cap being normally biased to an open position wherein said passage communicates with the exterior of said device through said at least one aperture, but being resiliently depressable to a closed position by manually depressing said button portion, said rim portion overlying said closure surface and said at least one aperture in said rim portion being obstructed by said closure surface to thereby obstruct said passage when said cap is in said closed position.

4,534,543

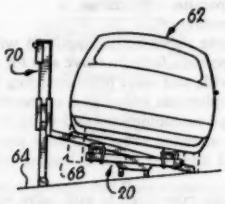
METHOD OF ELEVATING A FOUR WHEEL VEHICLE UTILIZING A TILTABLE SUPPORT STAND

Joseph L. Gray, St. Joseph, Mo., assignor to Gray Manufacturing Company, Inc., St. Joseph, Mo.

Division of Ser. No. 261,612, May 8, 1981, abandoned. This application Jun. 13, 1983, Ser. No. 503,702

Int. Cl.³ B66F *3/00*

U.S. Cl. 254—1 **2 Claims**



1. A method of elevating a four wheel vehicle off a floor, comprising the steps of:

tilting said vehicle with the tires on one side thereof engaging said floor and the tires on the other side of the vehicle elevated;

placing a vehicle support beneath the tilted vehicle, said support having a base presenting a pair of laterally spaced apart floor engaging side margins, a beam oriented with the longitudinal axis transverse to the direction of tilting of the support and being of greater length than the distance between said side margins and rigidly secured to said base with opposed end extremities of the beam extending outwardly beyond respective base margins, and a pair of laterally-spaced-apart vehicle-engaging and supporting regions adjustably carried by the beam, each of said regions being outboard of a corresponding side margin of said base;

tilting said support until the vehicle-engaging region closest said floor-engaging tires contacts the underside of the vehicle, the base margin closest said floor-engaging tires is in engagement with the floor, the remaining base margin is elevated from the floor, and the center of gravity of said vehicle lies in a plane passing between said base side margins; and

causing said vehicle to become righted by reverse tilting of the vehicle and support back to a position where both of said vehicle-engaging regions engage the underside of the vehicle and both of base side margins engage said floor with said vehicle thereby being at least partially supported above the floor solely by said vehicle support.

4,534,544

LIFT

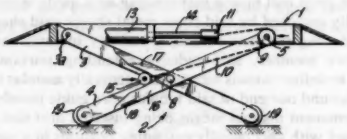
Carsten Heide, Bielefeld, Fed. Rep. of Germany, assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Oct. 14, 1983, Ser. No. 542,288

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1982, 8229071[U]

Int. Cl.³ B60P *1/48*

U.S. Cl. 254—9 C **4 Claims**



1. A lift comprising: a platform having a top side on which an article to be lifted rests and an underside; and a scissors jack attached below the platform and comprising a shaft disposed at the underside of the platform and having two chain wheels rotationally fixed thereto, means connected to the platform for guiding the shaft for movement along one direction parallel to the underside of the platform, a first pair of parallel scissoring legs having one end of each articulated with the platform, a second pair of parallel scissoring legs havine one end of each attached to the shaft and wherein the first and second pairs of legs are connected at scissoring axes intermediate of each of the first and second pairs of legs, a transverse beam, means fixed to the underside of the platform and connected to the transverse beam for moving the transverse beam parallel to the underside of the platform along said one direction and towards and away from the shaft, a pair of auxiliary rails connected at one end to the shaft and at an intermediate point to the scissoring axes, a cross-head connecting the free ends of the pair of auxiliary rails, a pair of guide rails connected at one end to the scissoring axes, wherein the pairs of auxiliary rails and guide rails have curved portions and form a wedge-shaped gap with an open side that faces away from the scissoring axes, and the pairs of auxiliary rails and guide rails are about half as long from the scissoring axes to their free ends as the free ends of the first and second pairs of scissoring legs to the scissoring axes, an axle disposed parallel with the shaft and having two independently rotating rollers mounted on each end thereof and resting against one auxiliary rail and one guide rail at the curved portions thereof and two chains connected at one end to the axle and which extend around the chain wheels on the shaft and are connected at the other end to the transverse beam.

4,534,545

VEHICLE SUSPENSION UNIT WITH REPLACEMENT AIR SPRING

Wayne V. Fannin, Xenia, and James M. Pees, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

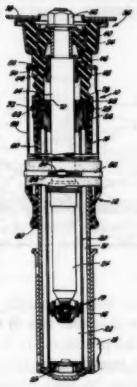
Continuation of Ser. No. 324,490, Nov. 24, 1981, abandoned. This application Apr. 9, 1984, Ser. No. 597,967

Int. Cl.³ F16F *9/04*

U.S. Cl. 267—64.24 **3 Claims**

1. A hydraulic suspension unit for mounting a road wheel assembly to a vehicle and for pneumatically suspending a body of the vehicle to said road wheel assembly comprising an elongated cylindrical support casing having one end connected to said road wheel assembly and extending upwardly therefrom, an outer tubular member surrounding a portion of said casing and forming a dust tube means, shock absorber means operatively mounted in said support casing, said shock absorber means including a motion damping piston operatively mounted in said casing, said piston having a rod extending from said casing and operatively connected to the body of the

vehicle, an upper fitting disposed around an upper portion of said casing, said upper fitting being formed as a cup-like member having a thin wall metallic cylinder of substantially uniform thickness, said metallic cylinder having an inner surface closely fitting and contacting only the upper outer cylindrical surface of said support casing and terminating at an end point adjacent to the upper end of said support casing, detent means extending inwardly from said metallic cylinder, recess means



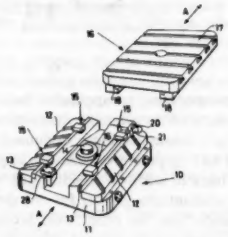
in said outer cylindrical surface for receiving said detent means to lock said fitting onto the upper end of said support casing, a pneumatic spring including an elastomeric sleeve having a lower end connected externally to said outer tubular member and having an upper end connected to said fitting, static fluid seal means operatively disposed below said detent means and between said upper fitting and said casing to pneumatically seal the upper end of said pneumatic spring.

4,534,546

DEVICE FOR LOCATING AND LOCKING A WORK HOLDING PALLET ON A MACHINE TOOL FIXTURE

Alberto Cattani, Modena, Italy, assignor to COMAU S.p.A., Grugliasco, Italy

Filed Nov. 22, 1983, Ser. No. 554,341
Claims priority, application Italy, Jul. 12, 1982, 54037/82[U]
Int. Cl.³ B23Q *3/02*
U.S. Cl. 269—58 **4 Claims**



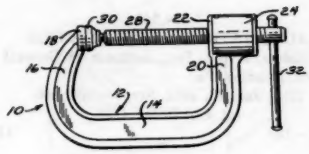
1. A device for locating and locking a work holding pallet on a machine tool fixture, in which the fixture comprises guides for supporting and guiding the sliding movement of the work holding pallet during their engagement, and a mobile central plug for engaging in a cavity in the work holding pallet, characterized in that said sliding movement is rectilinear sliding movement and the fixture is provided with first mobile means for pressing against the work holding pallet in order to move it with rotary motion about said plug in a direction having a component transverse to the direction of said rectilinear sliding movement, and second abutment and stop means for the work holding pallet in order to arrest said rotation.

4,534,547

RAPID ACTING C-CLAMP

Edward A. Cox, Olympia Fields, Ill., assignor to Wilton Corporation, Palatine, Ill.

Filed Apr. 16, 1984, Ser. No. 600,763
Int. Cl.³ B25B *1/02*
U.S. Cl. 269—182 **8 Claims**



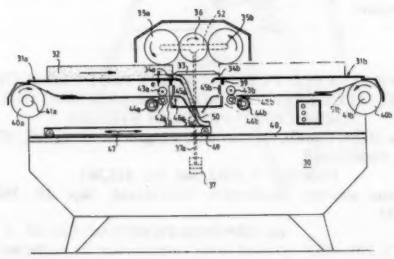
1. A rapid advance screw thread construction comprising a housing having a side wall which is at least in part substantially semi-cylindrical and further having spaced end walls, said housing having an internal arcuate rib in said substantially semi-cylindrical portion, said end walls having aligned cylindrical openings therethrough, a screw threaded spindle passing through said openings and said housing and rotatably and axially movable in said openings, a nut member in said housing having a smooth bore therein through which said spindle passes for free axial movement, said nut member having an offset overlapping partially threaded bore for selective threaded cooperation with the threads on the spindle for threaded movement of said spindle through said nut member, and yieldable means in said nut member pressing transversely on the threads of said spindle for frictionally tending to turn said nut member with said spindle, said nut member being so dimensioned and proportioned relative to said housing rib that it engages one portion or another of said rib depending on the direction of turning of said spindle to cause engagement or disengagement of the partial threads in said nut member with the threads of said spindle for threaded or free axial movement of said spindle through said nut member, said rib being substantially semi-circular and having portions thereof of at least two different radii.

4,534,548

BACON SLICING MACHINE

Fernand Hanau, 15 Blvd. Flandrin, 75016 Paris, France

Filed Nov. 8, 1983, Ser. No. 549,734
Claims priority, application France, Nov. 12, 1982, 82 18983
Int. Cl.³ B65H *39/02*; B65B *35/30*
U.S. Cl. 270—58 **21 Claims**



1. A bacon slicing machine comprising a plate for receiving

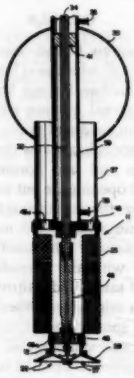
a piece of bacon laid flat, a means for driving said piece of bacon in translation, formed more especially by a cylinder driven in rotation, and situated transversely and above said reception plate, which drive means causes said piece of bacon to advance against a cutting device acting in a plane parallel to said reception plate, situated above and at a distance from said plate corresponding to the thickness of a bacon slice, a plate for receiving bacon slices and a plate for recovering the piece of bacon, said machine further comprising a means for laying on the bacon reception plate a sheet of non adherent material between two successive bacon slices.

4,534,549

AUTOMATIC BATTERY STACKER

William J. Eberle, Irving, Tex., assignor to General Battery Corporation, Reading, Pa.

Filed Jun. 22, 1982, Ser. No. 390,806
Int. Cl.³ B65H *3/08*
U.S. Cl. 271—103 **11 Claims**



1. Apparatus having a central opening and surrounded by a flexible ring and adapted to capture a single member from a plurality of members by drawing a vacuum through said central opening comprising:

(a) detection means suspended across a portion of said central opening and below the flexible ring,

(b) means located within said central opening for generating a positive pressure that impinges upon said detection means while simultaneously drawing said vacuum through the central opening,

(c) whereby when said single member is in proximity to said apparatus, it becomes captured thereby by means of said negative pressure drawn through said central opening, and said positive pressure is terminated by said detection means.

4,534,550

APPARATUS FOR PULLING APART FLAT PRODUCTS, ESPECIALLY PRINTED PRODUCTS ARRIVING IN AN IMBRICATED PRODUCT STREAM

Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Sep. 7, 1982, Ser. No. 415,361
Claims priority, application Switzerland, Sep. 18, 1981, 6048/81
Int. Cl.³ B65H *29/68*
U.S. Cl. 271—183 **9 Claims**

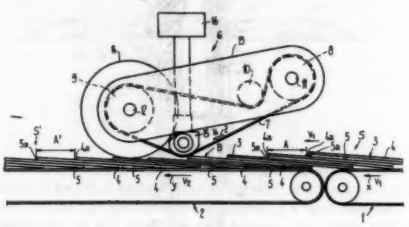
1. An apparatus for pulling apart substantially flat products, especially printed products, arriving in an imbricated product stream, comprising:

an infeed device for the products which move in a predetermined direction of travel;

a conveyor device arranged after said infeed device with respect to the direction of travel of the products;

said conveyor device having a conveying velocity which is greater than the conveying velocity of the infeed device;

a retarding device having an effective region for temporarily acting upon the products moving past said effective region of said retarding device;



said retarding device being arranged at the region of the conveyor device and at that side of the products at which leading edges of the products are freely exposed; and

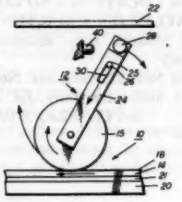
said retarding device retarding the forward movement of the products acted upon by said retarding device for such length of time until a trailing product arrives at said effective region of the retarding device.

4,534,551

DOCUMENT BELT NORMAL FORCE CONTROL

Jack E. Jones, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1983, Ser. No. 499,935
Int. Cl.³ B65H *5/02*
U.S. Cl. 271—275 **6 Claims**



1. In a document transport apparatus for reversibly feeding document sheets with a reversible direction of motion, document feeding belt means having a document engaging lower belt flight, and having pressure means for applying pressure to an area of the back of said lower belt flight, which pressure is automatically substantially greater for one direction of motion of said belt means than the other, said pressure means being mounted to engage and be moved solely by said lower belt flight, the improvement comprising:

first means comprising a pivotable lever for applying a preset maximum solely gravitational force with said pressure means to said document imaging lower belt flight, said first means being actuated solely by said engagement and movement of said pressure means by movement of said lower belt flight in one direction of motion,

and second means for counteracting said gravitational force of said pressure means automatically in response to the reversal of direction of said lower belt flight of said belt means to apply a greatly reduced pressure to said lower

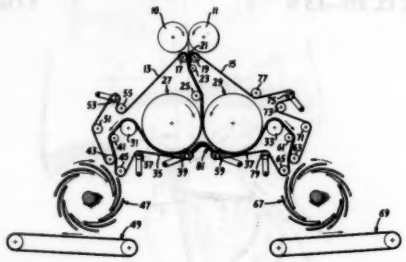
belt flight only in said reversed direction of motion of said lower belt flight.

4,534,552

SHEET DIVERTING SYSTEM

Thomas E. Rahe, York, Pa., assignor to Motter Printing Press Co., York, Pa.

Filed Jul. 20, 1983, Ser. No. 516,050
Int. Cl.³ B65H *29/60, 29/68*
U.S. Cl. 271—279 **3 Claims**



1. A sheet handling system for dividing a stream of sheets into at least two streams of sheets comprising

first and second driven sheet separating cylinders mounted for rotation about axes parallel to each other,

first gripping means mounted on the first separating cylinder for engaging the leading edge of a sheet in a gripping zone disposed between the first and second separating cylinders,

second gripping means mounted on the second separating cylinder for engaging the leading edge of another sheet in the gripping zone,

the separating cylinders being driven in phase such that the first and second gripping means are alternately carried through the gripping zone,

a pair of sheet feeding tapes, each guided in a separate closed path and wrapping around in engagement with the outer periphery of one of the cylinders,

means for guiding the tapes in converging paths to receive the sheets seriatim and accelerate them to space them further apart, then guiding the tapes in parallel paths between the cylinders to support the spaced apart sheets between the tapes throughout the lengths of the sheets while carrying them through the gripping zone in timed relation to the gripping means, whereby the leading edge of the sheet is introduced into the respective gripping means and the gripping means engages the leading edge while both the leading edge and gripping means are moving at the same velocity, and then guiding the tapes in diverging paths in engagement with the respective cylinder,

means for guiding the sheets from the first separating cylinder downstream of the gripping zone to a first delivery station, and

means for guiding the sheets from the second separating cylinder downstream of the gripping zone to a second delivery station.

4,534,553

EXERCISE APPARATUS

Steven E. Shirley, P.O. Box 54, Scottsburg, Ind. 47170

Filed Sep. 7, 1982, Ser. No. 415,357
Int. Cl.³ A63B *23/02, 23/04*
U.S. Cl. 272—73 **7 Claims**

1. An exercise apparatus for aiding the performance of multiple, simultaneous exercises, said apparatus comprising:

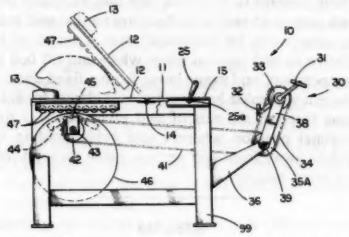
a frame;

seat support means for supporting the buttocks of a person on said frame;

back support means for supporting the back portion of a person on said frame, said back support means being pivotally mounted in relation to said seat support means;

pedal means for pedalling by a person positioned on said seat support means and said back support means;

a drive axle, said drive axle being mounted to said frame below said back support means;



drive means for translating the pedalling action of said pedalling means to rotation of said drive axle;

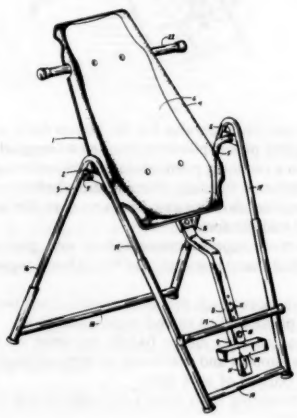
a cam mounted to said drive axle and rotatable therewith, said cam engaging and supporting said back support means, said cam and said back support means being cooperatingly shaped such that rotation of said cam, caused by pedalling of said pedalling means, causes said back support means to cyclically pivot.

4,534,554

FULL BODY WEIGHT TRACTION DEVICE

Jack V. Miller, Sierra Madre, Calif., assignor to Gravity Guidance, Inc., Duarte, Calif.

Continuation of Ser. No. 291,064, Aug. 7, 1981, Pat. No. 4,410,176. This application Oct. 14, 1983, Ser. No. 542,220
The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.
Int. Cl.³ A63B *17/00*
U.S. Cl. 272—144 **2 Claims**



1. An exercise device comprising:

(a) a pair of spaced apart pivot bearings;

(b) means for supporting said pivot bearings in a coaxial relationship parallel to and spaced above a floor surface;

(c) a tilt bed disposed between said pivot bearings and pivot-

ally mounted therein at its approximate midpoint, and an extension means extending longitudinally from the lower end thereof;

(d) ankle holding means attached to said extension means for the secure attachment of a user's ankles to said tilt bed;

(e) a pivot stop means wherein said tilt bed supporting the user may be rotated to a stop position with said ankle holding mean. rotated past the vertical plane through the axis of said pivot bearings;

(f) adjustment means on said tilt bed which allows said ankle holding means to be selectively longitudinally positioned with respect to said pivot bearings so that said ankle holding means can be positioned over a range of locations relative to said vertical plane when said tilt bed is at said stop position, said range being from a fixed distal position wherein said ankle holding means is closest to said vertical plane through the axis of said pivot bearings to a fixed proximal position wherein said ankle holding means is farthest away from said vertical plane through the axis of said pivot bearings.

4,534,555

THERAPEUTIC DEVICE FOR A HUMAN BODY

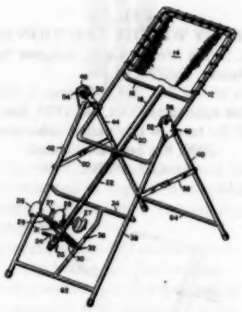
Wayne H. McGowen, 4930 Mill Creek, Dallas, Tex. 75234

Continuation of Ser. No. 349,451, Feb. 17, 1982, Pat. No. 4,438,761, which is a continuation-in-part of Ser. No. 324,133, Nov. 23, 1981, abandoned. This application Nov. 3, 1983, Ser. No. 549,272

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.³ A63B *17/00*

U.S. Cl. 272—145 **8 Claims**



1. A therapeutic apparatus for the human body comprising:

an elongated planar platform adapted to support the upper body in a reclining position, said platform being pivotally mounted on a fulcrum wherein said platform is pivotally displaceable about an axis transversed to the longitudinal axis of said platform;

a lower body support connected to said platform by an elongated frame member, said lower body support including:

a first support means mounted on said lower body support and positioned to extend under each foot;

a second support means fixedly mounted on said lower body support and positioned to surroundingly engage a first portion of each foot;

a first mounting shaft fixedly mounted to said lower body support;

a second mounting shaft slidably disposed in telescoping fashion within said first mounting shaft;

a third support means mounted to said second mounting shaft and adapted to surroundingly engage a second portion of each foot and fixedly restrain each foot while disposed proximate to said second support means and adapted to release each foot while disposed distal to said second support means; and

biasing means for urging said third support means toward said second support means.

4,534,556

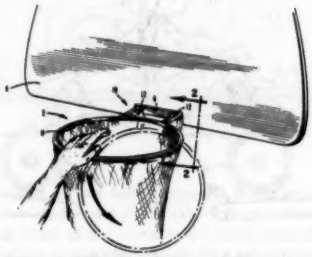
BREAK-AWAY BASKETBALL GOAL

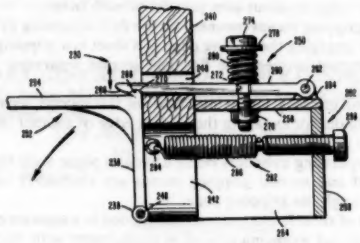
Paul D. Estlund, 4174 S. Kalispell, Aurora, Colo. 80013, and Kenneth F. Estlund, 8983 Inspiration Dr., Parker, Colo. 80134

Filed Jan. 27, 1977, Ser. No. 763,221

Int. Cl.³ A63B *63/08*

U.S. Cl. 273—1.5 R **5 Claims**





4. A backboard and break-away basketball goal assembly, including:

a backboard;

a hoop having supporting arm structure thereon;

means for pivotally connecting said hoop with said backboard, for pivoting movement about a horizontal axis from a normal, horizontal position, to a break-away position;

detent mechanism means carried by said backboard and said hoop and its supporting arm structure for mechanically releasably securing said hoop in said normal, horizontal position, said detent mechanism means being constructed to mechanically disengage when a deflecting force exceeding a predetermined value is applied to said hoop, and to then mechanically re-engage during return of said hoop from said break-away position,

said detent mechanism means including at least one resiliently yieldable portion on one of said backboard and said hoop and its supporting arm structure, arranged to mechanically engage with and hold detent projection means provided on the other of said backboard and said hoop and supporting arm structure, said resiliently yieldable portion being mechanically settable whereby to adjust said assembly to respond to different applied deflecting forces; and

means connected with said backboard and with said hoop and supporting arm structure, effective for returning said hoop to its normal, horizontal position.

4,534,557

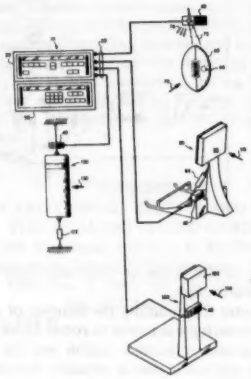
REACTION TIME AND APPLIED FORCE FEEDBACK

Stephen L. Bigelow, 189 Ventnor Ave., Aspen, Colo. 81611, and John A. Carlin, 1795 S. St. Paul, Denver, Colo. 80210

Continuation of Ser. No. 246,267, Mar. 23, 1981, abandoned. This application May 25, 1983, Ser. No. 496,985

Int. Cl.[3] A63B *69/00*

U.S. Cl. 273—55 A 4 Claims



1. A reaction time and applied force feedback training system for a sport activity having at least one sport training device (60), said system further comprising:

an input keyboard (1640) for providing signals in response to manually preset values corresponding to (a) a predetermined reaction time, (b) a predetermined level of applied force, and (c) a predetermined repetition timing sequence,

a stimulus indicator (40) located near but physically separated (401) from each said at least one sport training device (60) for emanating a plurality of ready signals (74), each of said ready signals (74) signaling the user of said system to apply a manual force (210) to said at least one sport training device (60), said stimulus indicator (40) being further capable of emanating a miss signal,

a sensor (45) operatively connected to each said at least one sport training device (60) receptive of forces resulting from said manual force (210) applied by said user, to any location on said sport training device (60), for generating an electrical signal (900), said electrical signal (900) having a magnitude proportional to the magnitude of said manually applied force (210),

a personality channel (430) in communication with both said stimulus indicator (40) and said sensor (45), said personality channel (430) comprising:

(a) means (600) in communication with said sensor (45) for detecting the analog value (910) of the highest magnitude of said electrical signal (900) thereby eliminating extraneous signals of lower magnitude caused by ringing of the applied manual force (210) in said at least one sport training device (60),

(b) means (630) receptive of said analog value (910) from said detecting means (600) for converting said analog value (910) into a binary applied force signal (680) corresponding to said highest magnitude of said electrical signal, and

(c) means (1000) in communication with said stimulus indicator (40) for activating said stimulus indicator (40) to selectively emanate said ready and miss signals,

a control unit (20) remote from said stimulus indicator (40) and said sensor (45) and connected to said input keyboard (1640) and to said personality channel (430), said control unit (20) upon initialization of said system being capable of storing a binary existing force signal from said personality circuit (430) corresponding to the existing force on said sensor (45) associated with said at least one sport training device (60), said control unit (20) being receptive of said binary applied force signal from said personality channel (430) and of said binary existing force signal for generating an offset signal corresponding to the true magnitude of said manually applied force (210), said control unit (20) being receptive of said predetermined repetition timing sequence from said input keyboard (1640) for randomly activating said activating means (1000) within said repetition timing sequence in order to emanate said plurality of ready signals, and said control unit (20) being further capable of producing a timing signal corresponding to the actual reaction time between the aforesaid activation of said stimulus indicator (40) and the receipt of said binary applied force signal by said control unit, said control unit (20) being capable of enabling said activating means (1000) in said personality circuit (430) to activate said stimulus indicator (40) in order to emanate said miss signal to said user in the event said manually applied force (210) is less in value than said predetermined level of applied force and in the event said reaction time is less than said predetermined reaction time, and

means (1600) connected to said control unit (20) and receptive of said offset signal and of said timing signal for displaying the true magnitude of said manually applied force and the actual reaction time of said user in applying said manual force to said sport training device after each said ready signal.

4,534,558

GOLF CLUB HEAD

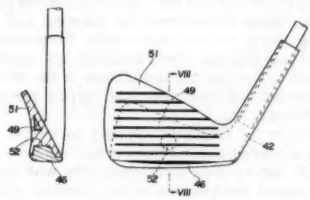
Minoru Yoneyama, Niigata, Japan, assignor to Yonex Kabushiki Kaisha, Niigata, Japan

Filed Aug. 17, 1983, Ser. No. 524,039

Claims priority, application Japan, Dec. 28, 1982, 57-196213[U]; Dec. 28, 1982, 57-196214[U]; Jun. 3, 1983, 58-83929[U]; Jun. 3, 1983, 58-83930[U]; Jun. 7, 1983, 58-85790[U]

Int. Cl.[3] A63B *53/04*

U.S. Cl. 273—78 7 Claims



1. A golf club head comprising:

a sole formed of metal material;

a core of metal material formed integrally with said sole, said core extending upwardly from said sole and having a substantially triangular shape in cross section, a lower end of said core having a thickness in a direction of swing of the head smaller than that of said sole to provide front and rear shoulders therebetween;

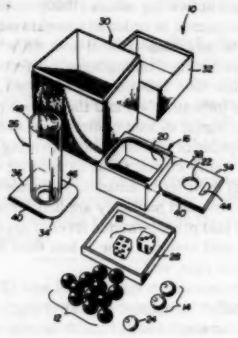
a hosel for receiving a shaft therein and formed of metal material integrally with said sole and said core, said hosel being connected to said sole and said core at a heel portion of the golf club head; and

an outer head member formed of carbon fiber reinforced resin material, said outer head member having a substantially inverted V-shaped cross-sectional configuration covering the entirety of said core, lower ends of said outer head member being in close contact with said shoulders with marginal edges of said lower ends being flush with said sole, and said outer head member including an integral tubular extension covering the entirety of said hosel.

4,534,559
GAME PLAYING APPARATUS

Donald Laursen, Jr., Fremont, Calif., assignor to Edmund Arthur Thrum, Fremont, Calif.

Filed Oct. 12, 1982, Ser. No. 433,469
Int. Cl.³ A63F 7/04
U.S. Cl. 273—113 **5 Claims**



1. A game comprising:

a plurality of first spherical playing pieces, each of said first spherical playing pieces being visually similar to each other;

a plurality of second shperical playing pieces visually distinct from said first spherical playing pieces, each of said second spherical playing pieces being visually similar to each other;

a third spherical playing piece visually distinct from each of said first spherical playing pieces and each of said second spherical playing pieces;

a container having an interior cavity and an opening communicating with said cavity exteriorily of said container, said cavity being dimensioned for loosely containing all of said first spherical playing pieces, said second spherical playing pieces and said third spherical playing pieces, said opening being dimensioned for allowing said spherical playing pieces to pass sequentially therethrough upon manual manipulation of said container, said opening being elliptical to increase the randomness in the order of said first, second and third spherical playing pieces passing therethrough; and

indicia means for randomly selecting an indicia, said first spherical playing pieces being for removal from container through said opening commensurately with said indicia upon manual manipulation of the container prior to any one of said second playing pieces passing through said opening, said third playing piece when passing through said opening nullifying the effect of at least a subsequent one of said second playing pieces passing through said opening.

4,534,560
SLOT MACHINE

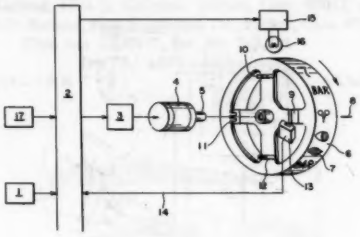
Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed May 20, 1983, Ser. No. 496,578
Claims priority, application Japan, May 21, 1982, 57-85039
Int. Cl.³ A63F 5/04
U.S. Cl. 273—143 R **6 Claims**

1. A slot machine provided with a plurality of pulse motor driven reels each having an annular series of various symbols on the peripheral surface thereof at regular intervals, said slot machine comprising:

a plurality of light shield plates for dividing said peripheral surface of each reel into a plurality of regions each containing a plurality of said symbols, said light shield plates being different in shape from each other and being arranged at concyclic positions and at the front edges of said respective divided regions so as to distinguish the respective divided regions;

photo-detecting means for every reel stationarily provided in a passageway of said light shield plates for producing a series of pulse signals with different wave forms one corresponding to the shape of each said light shield plate passing therethrough;

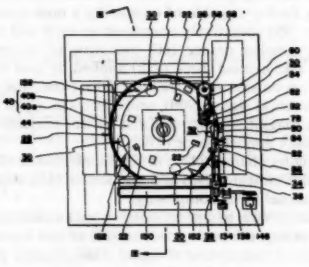


a microcomputer for counting the number of pulse signals which cause each pulse motor to rotate by an angle corresponding to said respective region and for detecting a position of said each reel in rotation according to said counted number of pulse signals and said pulse signals whose wave forms correspond to respective said regions.

4,534,561
TILE ARRANGING APPARATUS FOR AUTOMATIC GAME PLAYING TABLE

Toshinori Okuno, and Hiroshi Nakamura, both of Saitama, Japan, assignors to Dengen Automatic Co. Ltd., Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,394
Claims priority, application Japan, Dec. 10, 1982, 57-215503
Int. Cl.³ A63F 1/12, 1/14
U.S. Cl. 273—149 R **8 Claims**



1. A game tile arranging apparatus for an automatic game playing table, comprising:

a hopper provided in the table;

a mixing member for mixing the tiles, rotatively disposed within said hopper for rotation about a rotational axis;

an orientation controlling member, having an inlet and an outlet, for controlling the orientations of the tiles, said orientation controlling member including means, rotatable in a different direction than said mixing member, for rotatively engaging the tiles in said hopper between said inlet and said outlet;

orientation detecting means, responsive to the orientation of tiles at a first location outside said hopper, for providing a first signal indicative of the orientation of the tiles at said first location;

means, responsive to said first signal, for correcting the

orientations of the tiles whose orientations are detected by said orientation detecting means;

means for receiving and transferring tiles at a second location in said hopper to said first location outside said hopper;

sensor means, responsive to the number of tiles received by said receiving and transferring means, for providing a second signal indicative of said number;

means for directing tiles from said outlet of said orientation controlling member to said second location; and

gating means, having an inlet portion adjacent said outlet of said orientation controlling member and responsive to said second signal, for alternatively directing tiles from said outlet to said second location or gating the tiles at said outlet away from said second location so as not to be received and transferred by said receiving and transferring means.

4,534,562

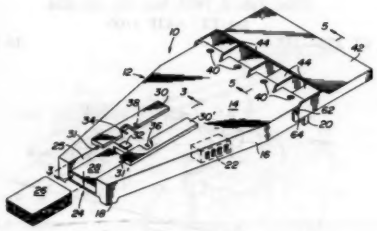
PLAYING CARD CODING SYSTEM AND APPARATUS FOR DEALING CODED CARDS

Richard A. Cuff, Rosemont, and Paul R. Hoffman, Exton, both of Pa., assignors to Tyler Griffin Company, Paoli, Pa.

Filed Jun. 7, 1983, Ser. No. 502,050

Int. Cl.³ A63F *1/14*

U.S. Cl. 273—149 P **6 Claims**



1. Apparatus for dealing coded playing cards in accordance with at least one predetermined hand, comprising:

a housing,

an opening in the housing for introducing at least one coded playing card into the apparatus,

means for electro-optically reading the coded cards one at a time as the coded cards are moved manually past the reading means,

card guide means operatively associated with the reading means for guiding only one card at a time past the reading means,

a pad of high-friction material located approximately in the center of the card guide means for preventing more than one card at a time from entering the card guide means,

means for comparing the code read from each card against the predetermined hand to determine to which player position the card should be dealt, and

indicating means to provide a visual indication of which player position the card should be dealt to.

4,534,563

THREE DIMENSIONAL PUZZLE

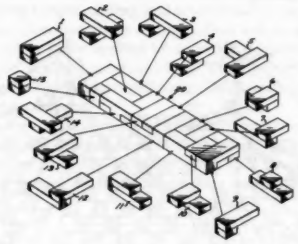
Geoffrey L. Guenther, 26834 Hyte Rd., Rancho Palos Verdes, Calif. 90274

Filed Oct. 6, 1983, Ser. No. 539,481

Int. Cl.³ A63F *9/12*

U.S. Cl. 273—157 R **9 Claims**

6. A three dimensional puzzle game comprising a plurality of component pieces, each of said component pieces being unique from each other, and forming two or more right rectangular prisms when assembled in particular configurations, the number of prisms being formed being dependent on the puzzle unit volume of the puzzle and the prime factors of said volume, each of said component pieces comprising units of preselected length, width and height, each component piece further comprising an integrated structure having two levels of rectangular



cross sectional material arranged in a predetermined manner with respect to each other, each level having a dimension equal to the unit width and unit height and a length equal to said unit width or multiples thereof.

4,534,564

GOLF CLUB HEAD

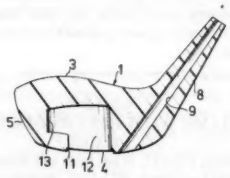
Magoichi Yamada, Tokyo, Japan, assignor to Daiwa Golf Co., Ltd., Kurume, Japan

Filed Jul. 18, 1983, Ser. No. 515,379

Claims priority, application Japan, Jul. 21, 1982, 57-110398[U]

Int. Cl.³ A63B *53/04*

U.S. Cl. 273—169 **1 Claim**



1. A golf club driver head comprising:

(a) a club head body made of high density plastic, and having a face portion, a top portion, a sole portion having a step for mounting a sole plate, a toe portion, a heel portion, a back portion and a neck;

(b) said club head body having a cavity extending upwardly from an opening located substantially centrally of said sole portion;

(c) a sole plate mounted at said step and covering said opening of said sole portion, said sole plate having a configuration substantially corresponding to that of said sole portion, except for a narrowed portion substantially midway between the region of the face portion and the region of the back portion;

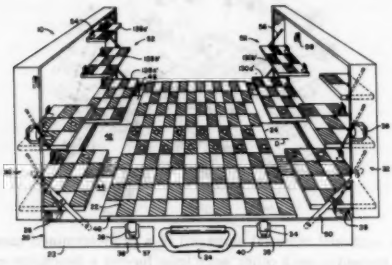
(d) said club head body having a blind bore devoid of any weighting material extending transversely from the inner end of said cavity and forwardly towards said toe portion;

(e) said bore and cavity together with said centrally narrowed sole plate distributing the weight or mass of said head body to the peripheral portion thereof.

4,534,565
MULTI-LEVEL BOARD GAME

Lawrence D. Hube, 7722 Edgewood Rd., Pasadena, Md. 21122

Filed Jun. 28, 1984, Ser. No. 625,675
Int. Cl.[3] A63F *3/02*
U.S. Cl. 273—241 4 Claims

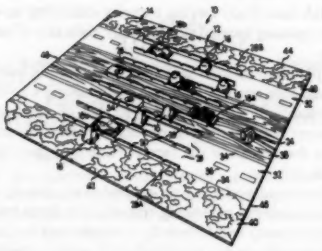


1. In a system of board game with a plurality of planar elements having respective rectangular arrays of playing squares, means for holding the planar elements, token, and chance apparatus, the improvement comprising: first and second opposed kingdoms including a game board having a plurality of entrance squares located on opposite sides of a central part of the game board; to the left of each kingdom a sanctuary including: an intermediate size planar element at a level above the game board and a smaller planar element at a level above the intermediate size planar element; to the right of each kingdom a domain including three planar elements, the first two planar elements thereof being situated similarly to the intermediate size and smaller size planar elements of the sanctuary and the third planar element thereof being smallest and uppermost; the means for holding including a case half, a pair of case quarters, hinge means for holding the case quarters upright in open position on the case half and for permitting the case quarters to close for covering the case half, and means for pivotally supporting each said planar element in position for playing said board game when the case quarters are in open position and for causing each planar element to fold as the case quarters close.

4,534,566
BOARD GAME WITH REVERSIBLE SECONDARY PIECES

Michael J. Ferris; Paul H. Wise, both of Chicago, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Continuation of Ser. No. 426,368, Sep. 29, 1982, abandoned. This application Aug. 6, 1984, Ser. No. 638,531
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—248 18 Claims



1. A board game for two players comprising:

a game board having a generally planar playing surface with a plurality of playing positions;

said playing positions being arranged in a plurality of generally parallel rows and parallel columns, said rows being arranged generally perpendicularly to said columns;

a separate first set of playing pieces for each player positionable on said playing surface;

a common second set of playing pieces for both players positionable on and moveable over said playing surface within said rows;

said playing pieces of said second set including first and second groups of playing pieces, said first group of playing pieces having two distinct opposing sides, each of said sides providing a generally flat surface on which one of said playing pieces of said first set is positionable;

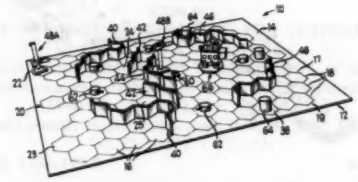
chance selection means for determining the extent of movement of said playing pieces; and

said rows being defined by a plurality of parallel upstanding members, said members including column indicators spaced uniformly along their lengths.

4,534,567
BOARD GAME WITH CHANCE DEVICE PLAYING PIECE

Michael J. Ferris; Paul H. Wise, both of Chicago, and Jeffrey D. Breslow, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 3, 1983, Ser. No. 463,636
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—255 16 Claims



1. A board game comprising:

a game board having a substantially planar surface;

a plurality of playing spaces on the surface;

first indicia on the board identifying at least one of the spaces as a player start position;

second indicia on the board defining a contiguous number of the spaces as a target zone remote from the start position;

a moveable target piece positionable on spaces within the target zone;

a plurality of available paths extending from space to space between the start position and the target zone;

a moveable player token for each player;

at least one three dimensional wall with a top disposed transverse to the surface across at least some of the available paths;

the token including a base and a marker slidably mounted on the base for movement from a first lower position adjacent the base and below the top of the wall to a second upper position remote from the base and above the top of the wall;

the moveable marker being biased into engagement with the base to retain the marker in the first or second position;

first and second chance means;

the first chance means bearing number indicia;

the second chance means bearing some indicia indicating the target piece;

defensive playing pieces;

third indicia on the board indicating other contiguous numbers of the spaces comprising portions of some of the available paths as danger zones; and

fourth indicia on the board designating one of the spaces of

each of the danger zones for placement of a defensive playing piece.

4,534,568

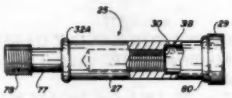
ARCHERY ARROW WITH FREELY ROTATIONAL BROAD BLADE ARROWHEAD TO AVOID WINDPLANING

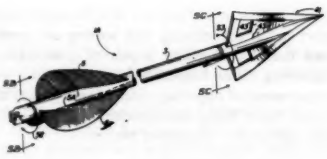
Richard D. Tone, 1849 W. Third Pl., Mesa, Ariz. 85201

Continuation-in-part of Ser. No. 319,186, Nov. 9, 1981, abandoned. This application Sep. 30, 1983, Ser. No. 537,587

Int. Cl.³ F41B *5/02*

U.S. Cl. 273—421 **15 Claims**





1. An improved arrowhead connector for rotationally connecting an arrowhead to the leading end of the shaft of an archery arrow, said arrowhead connector comprising in combination:

(a) insert means for rigid connection to said broad blade arrowhead to rotationally support said arrowhead on said leading end of said shaft, said insert means having an outer surface;

(b) insert receiving means rigidly attached to said leading end of said shaft and having a cylindrical hole therein for receiving and rotationally supporting said insert means with sufficiently low friction to allow sufficiently rapid relative rotation between said arrowhead and said shaft to substantially prevent windplaning of said arrow, said insert means having a generally cylindrical inner surface;

(c) a plurality of relatively thin, substantially spaced, circumferential, smooth surfaced, circular ridges disposed on said outer surface for making very low friction sliding contact with said cylindrical inner surface to allow said rapid relative rotation;

(d) retaining means attached to said insert means for effectuating rapid insertion of said insert into said insert receiving means, retaining of said insert means in free rotational relationship with said insert receiving means, and effectuating rapid removal of said insert from said insert receiving means to allow rapid removal and cleaning of said ridges and rapid reinstallation of said insert means in said insert receiving means; and

(e) forward ridges disposed at a forward end portion of said insert means and having a precisely rounded edge and a diameter slightly larger than the diameter of said generally cylindrical hole, wherein said cylindrical hole has an outwardly flared, low friction mouth portion, said rounded edge of said forward ridge precisely, rotationally abutting an outwardly flared surface of said mouth portion.

14. A method of reducing windplanning of an archery arrow, said method comprising the steps of:

(a) rotationally connecting an arrowhead to the shaft of said arrow with a very low friction rotational connection;

(b) applying torque causing said arrowhead to rapidly rotate in a first direction about a longitudinal axis of said shaft in response to force applied to an offset propelling surface attached in fixed relationship to said arrowhead by air through which said propelling surface passes during flight of said arrow; and

(c) applying torque causing said shaft to rapidly rotate about said axis in a second direction opposite to said first direction in response to force applied to said fletching by air through which said fletching passes during flight of said arrow.

4,534,569

STERN TUBE SEAL DEVICE PROVIDING A SEAL ABOUT A ROTATABLE SHAFT

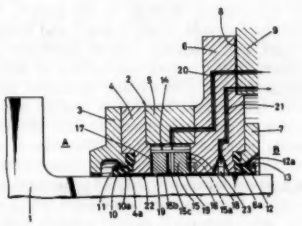
Kenichiro Ishitani; Takashi Unseki, both of Tokyo; Saburo Amiboshi, and Eiichi Kawamura, both of Saitama, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Eagle Industry Co., Ltd., both of Tokyo, Japan

Filed Mar. 26, 1984, Ser. No. 593,331

Claims priority, application Japan, Sep. 27, 1983, 58-148206; Sep. 27, 1983, 58-148207

Int. Cl.³ F16J *15/32, 15/40, 15/48*

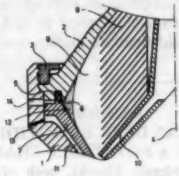
U.S. Cl. 277—27 **6 Claims**



1. A stern tube seal for providing a seal about a rotatable shaft which extends from the stern tube of a ship comprising an annular casing means disposed about the outer periphery of a rotatable shaft, said casing having a recess extending about said shaft, said recess having an outer radial recess surface, a floating ring member disposed in said recess, said floating ring member having an outer radial ring surface and an inner radial ring surface, said outer radial ring surface being spaced from said outer radial recess surface to form an outer clearance space therebetween, said inner radial ring surface being spaced from said shaft to form an inner clearance space therebetween, said ring member having passage means extending between said inner and outer clearance spaces, a first conduit means in said casing means for receiving fluid under pressure from the interior of said ship, said first conduit means communicating with said outer clearance space, a first and second seal means mounted on said casing means on opposite sides of said recess, a second conduit means in said casing means for recovering and returning said fluid to said ship, said second conduit means having an inlet opening in said casing means between said recess and said first seal means, said second seal means having an engaging portion engaging said shaft and a sloping portion extending from said engaging portion, said sloping portion sloping radially outwardly as said recess is approached such that fluid under pressure from said first conduit means communicating with said second seal means via said outer clearance space, said passage means, and said inner clearance space acts on said sloping portion of said second seal means to reduce the pressure with which said engaging portion of said second seal

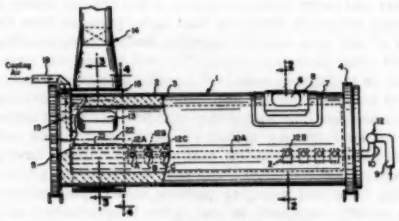
means engages said shaft to thereby reduce the sliding load between said second seal means and said shaft.

4,534,570
SEALING RING FOR A CENTRIFUGAL SEPARATOR
Jan Munde, Gnesta, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden
Filed Mar. 29, 1984, Ser. No. 594,986
Claims priority, application Sweden, Apr. 5, 1983, 8301850
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—95 **4 Claims**



1. A centrifugal separator comprising a rotor mounted for rotation about an axis, the rotor having a first part provided with an annular groove surrounding said axis, the rotor also having a second part provided with an annular projection surrounding said axis and toward which said groove opens through an annular opening of the groove, said projection having opposite the annular groove an annular abutment surface which is of smaller radial dimension and therefore narrower than said annular opening of the groove, said second rotor part being movable axially toward and away from said first rotor part, and a sealing ring of plastically deformable material located in the groove and having an annular sealing surface engageable by said annular abutment surface upon movement of said second rotor part toward said first rotor part, a portion of said ring closest to said abutment surface having annular bevelled edges at opposite sides of said annular sealing surface, whereby the ring has a cross-section which, at said closest portion, tapers toward said projection, said annular abutment surface having a radial dimension which is at least as large as the radial dimension of said annular sealing surface, whereby said annular abutment surface is at least as wide as said annular sealing surface.

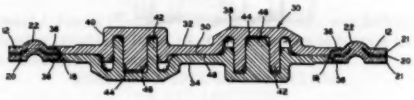
4,534,571
CIRCUMFERENTIAL SEALING ASSEMBLY
Allan F. Tittes; Kenneth H. Larson, and Kennith L. Britton, all of Claypool, Ariz., assignors to Inspiration Consolidated Copper Company, Claypool, Ariz.
Filed Mar. 19, 1984, Ser. No. 591,122
Int. Cl.³ F16J *33/72*
U.S. Cl. 277—128 **11 Claims**



1. A circumferential sealing assembly for use with a cylindrical body and a hood provided to collect hot gases from an opening in said cylindrical body as said cylindrical body is rotated, the circumferential sealing assembly comprising:

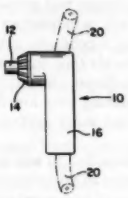
(a) a circumferentially extending housing;
(b) means for connecting the housing to a circumferentially extending area of the hood;
(c) a cable extending along, and at least partly outside, the housing for frictionally contacting a circumferentially extending area of the body; and
(d) tensioning means connected directly between the housing and cable for pulling the cable taught and into a tight pressure fit with the body.

4,534,572
PORT BAFFLE FOR ENGINE GASKET
Jerome G. Belter, Mt. Prospect, Ill., assignor to Dana Corporation, Toledo, Ohio
Filed Dec. 20, 1984, Ser. No. 684,302
Int. Cl.³ F16J *15/12*
U.S. Cl. 277—235 B **14 Claims**



1. A port baffle for closing and sealing an aperture in a gasket, said baffle comprising a pair of plate-like members having adjoining faces disposed for establishing peripheral sealing engagement of opposing sides of said gasket about said aperture, said faces being mechanically coupled together by mating post and socket connector elements.

4,534,573
CHUCK KEY
Robert I. Somers, Raleigh, N.C., assignor to Black & Decker, Inc., Newark, Del.
Filed Jun. 23, 1983, Ser. No. 506,997
Int. Cl.³ B23B *45/00*
U.S. Cl. 279—1 K **14 Claims**



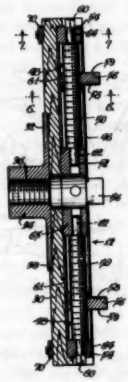
9. A chuck key comprising:
an integrally-formed, one-piece handle having an elongated portion and a post portion, said post portion projecting from one side of said elongated portion perpendicular to the axis thereof, said elongated portion having an axial groove in the other side thereof for receiving the electrical cord of said tool and including means for gripping said cord within said groove; and
means integral with the projecting end of said post portion for engaging a chuck to adjust the jaws thereof.

4,534,574

LIGHTWEIGHT CHUCK FOR WOODTURNING LATHE

Frank Hesh, 1155 W. Ogden, and Edward F. Groh, 850 Hillside Rd., both of, Naperville, Ill. 60540

Filed Sep. 29, 1983, Ser. No. 537,117
Int. Cl.[3] B23B 31/36
U.S. Cl. 279—112 8 Claims



1. A lightweight chuck for use on a woodturning lathe, comprising

a generally cylindrical chuck body forming a faceplate,

said chuck body being formed of a lightweight rigid structural material,

said body having radial grooves formed therein open from the faceplate and having a central cutout inboardly from the grooves and notched cutouts outboardly from the grooves also open from the faceplate,

an adjustment screw adapted to fit in each of the grooves,

inboard and outboard bearings for rotatably holding one of the adjustment screws in each of the grooves,

said inboard bearings all being fitted in the central cutout from the faceplate side of the chuck body,

said outboard bearings each being fitted in one of the respective outboard notched cutouts from the faceplate side of the chuck body, the notched cutouts defining abutments that serve to radially position the outboard bearings,

an elongated U-shaped channel guide fitted in each of the radial grooves with its open side open to the faceplate,

each U-shaped guide extending at its opposite ends to butt against the inboard and outboard bearings disposed in the groove,

a chuck jaw for each of the grooves and having a threaded bore adapted to be threaded onto the adjustment screw disposed therein,

said chuck jaw being shaped and sized to be fitted in the grooves from the faceplate side of the chuck body and be nonrotatably received in and keyed relative to the U-shaped channel guide and projecting forwardly of the open side thereof and beyond the faceplate, and being operable to slide along and within the channel guide upon rotation of the adjustment screw,

a mounting hub adapted to be secured to the lathe for powered rotation, and

means for securing the chuck body to the hub,

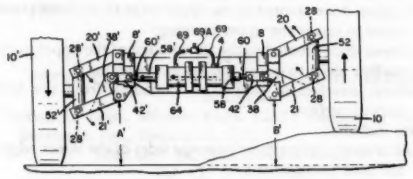
said securing means including locating the hub on the side of the chuck body remotely of the faceplate and bolt means extended from the faceplate side of the chuck body through openings in the chuck body and openings in the inboard bearings and threaded into taps in the mounting hub, operable also then to hold both the inboard bearings and hub relative to the chuck body.

4,534,575

VEHICLE SUSPENSION AND STEERAGE SYSTEM

John L. Grove, Greencaste; John L. Hockensmith, and Allen B. Coffman, both of Chambersburg, all of Pa., assignors to JLG Industries, Inc., McConnellsburg, Pa.

Filed Oct. 18, 1982, Ser. No. 434,733
Int. Cl.[3] B60G 19/06
U.S. Cl. 280—6.11 3 Claims



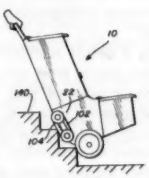
1. A vehicle having a frame, a pair of oppositely disposed, spaced, steerable wheels, a king pin for supporting each said wheel, and a suspension system connecting said frame and said wheels, said suspension system including means for supporting each said king pin with the axis thereof substantially vertical for pivotal movement about substantially horizontal axes adjacent said frame, said supporting means comprising upper and lower parallel suspension arms pivoted at their inner ends adjacent said frame, means for transmitting pivotal movement of one said upper and lower suspension arms to the other said upper and lower suspension arms and for causing said last mentioned arms to pivot a substantially equal amount and in the same rotary direction as said one upper and lower suspension arms, said movement transmitting means comprising a rod and means for connecting the ends of said rod to said suspension arms, means for rotating said wheels on said king pins, and means for selectively permitting or inhibiting pivotal movement of said suspension arms.

4,534,576

APPARATUS FOR TRANSPORTING FIREWOOD

William J. Jones, Jr., P.O. Box 42, Caddo Gap, Ark. 71935

Filed Mar. 1, 1983, Ser. No. 471,133
Int. Cl.[3] B62B 1/10
U.S. Cl. 280—47.26 3 Claims



1. An apparatus for transporting firewood comprising:

a container including:

first and second planar sides, each side including a vertical side portion and a forwardly extending horizontal side portion joined by a sectoral side portion, the vertical side portion being approximately twice as long as the horizontal side portion;

a planar back portion extending between back edges of the vertical side portions;

a planar front portion extending between front edges of the vertical side portions;

an upper curved surface extending between inner circular edges of the sectoral side portions;

a lower curved surface extending between outer circular edges of the sectoral side portions;

a bottom portion extending between lower edges of the horizontal side portions;

an end portion extending between outer edges of the horizontal side portions;

the upper edges of the vertical side portions, back portion and front portion forming an upper opening; and

the upper edges of the horizontal side portions and end portion and a lower edge of the upper curved surface forming a lower opening;

an upper door pivoted to the upper edge of the back portion sized to cover the upper opening;

a lower door pivoted to the lower edge of the upper curved surface sized to cover the lower opening;

wheels attached to stub axles extending from the lower curved surface;

a grip including:

two arms extending from opposite sides of the upper edge of the back portion; and

a cross member extending between the uppermost ends of the arms.

4,534,577

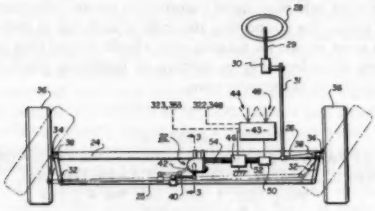
REMOTELY ADJUSTABLE STEERING COMPENSATOR

Durrell U. Howard, 306 Krameria Dr., San Antonio, Tex. 78213

Continuation-in-part of Ser. No. 93,968, Nov. 14, 1979, Pat. No. 4,410,193, and a continuation-in-part of Ser. No. 296,617, Aug. 27, 1981, Pat. No. 4,418,931. This application Jul. 11, 1983, Ser. No. 512,852

Int. Cl.³ B62D *5/06*

U.S. Cl. 280—90 **36 Claims**



1. A steering compensator apparatus for a steering system of a vehicle having at leat one steerable member movable away from a preselected position in response to a steering force, said apparatus comprising:

cam means including a detent member having at least one centering depression and at least one follower member in contact with opposite sides of said centering depression when said steerable member is in said preselected position;

connecting means for moving said follower member and said detent member relative to each other in response to movement of said steerable member away from said preselected position;

compression means for pressing together said follower member and said detent member so that contact pressure between said follower member and said centering depression resists relative movement between said detent member and said follower member and prevents substantial movement of said steerable member away from said preselected position until said steering force exceeds a predetermined value;

adjusting means operable for varying the contact pressure between said follower member and said centering depression so as to vary the amount of steering force required for substantial movement of said steerable member away from said preselected position; and,

control means for remotely operating said adjusting means so as to selectively vary the amount of said contact pressure while said vehicle is in operation.

4,534,578

MUSCLE DRIVEN, SINGLE TRACK BICYCLE

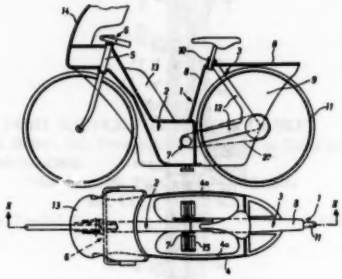
Roland Keller, Hauptstrasse 68, 8592 Uttwil, Switzerland

Filed Nov. 18, 1982, Ser. No. 442,781

Claims priority, application Switzerland, Nov. 18, 1981, 7412/81

Int. Cl.³ B62K *19/16*

U.S. Cl. 280—281 R **9 Claims**



1. A muscle driven, single track bicycle comprising a front and a rear wheel, a driving mechanism located between said front and rear wheels including chain driving means and two foot pedals and a frame structure made of plastic and integrated reinforcing elements, said frame structure including a central supporting structure in the form of a hollow case extending substantially between said front and rear wheels said chain driving means being located near said central supporting structure; said frame structure further including an outer bracing structure having a front portion and a rear portion laterally projecting from said central supporting structure and being connected thereto further having two lateral bracing members each extending between said front portion and said rear portion in a plane outside of the respective foot pedal thereby leaving a lateral distance to said central supporting structure and providing vertical openings for the foot pedals, said front portion of the outer bracing structure forming a fairing; said lateral bracing members being connected to said fairing at at least said front portion of said bicycle to reduce any drag factor and torsion associated with said bicycle.

4,534,579

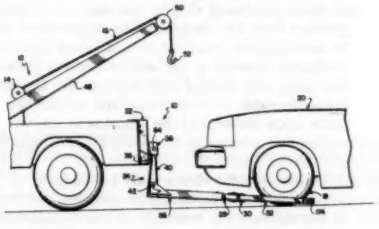
AUTOMOBILE WHEEL LIFT FOR A TOW TRUCK

G. Raymond Shackelford, Sr., Rte. 2, Box 351, Augusta, Ga. 30909

Filed Mar. 29, 1984, Ser. No. 594,796

Int. Cl.³ B60P *3/06*

U.S. Cl. 280—402 **23 Claims**



1. A mechanical wheel lift for engaging and lifting the wheels of a car for use on a tow truck having a winch and a cable thereon, the combination comprising:

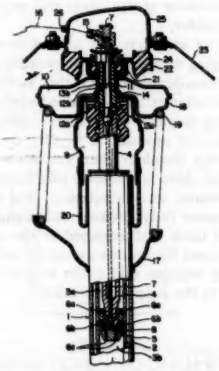
a support rigidly coupled in a substantially vertical position on the rear of the truck;
means defining a cam follower coupled to said support;
a pair of wheel-engaging forks; and
lifting means, coupled to said wheel-engaging forks slidably coupled to said support, and coupled to the cable on the winch, for reciprocating said wheel-engaging forks upwardly and downwardly and for pivoting said wheel-engaging forks towards and away from the rear of the truck upon reeling-in and paying-out of the cable,
said lifting means including a cam surface slidably engaging said cam follower,
said support including a pair of vertical tracks, and
said lifting means including a trolley coupled to said tracks for vertical reciprocating movement,
said cam surface being planar and being pivotally coupled to said trolley about a horizontal axis,
said cam surface extending at an acute angle downwardly and towards said cam follower under the influence of gravity.

4,534,580

SUSPENSION SYSTEM FOR VEHICLES

Kazuyoshi Kobayashi, Oobu, and Shozo Takizawa, Okazaki, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1984, Ser. No. 575,348
Claims priority, application Japan, Feb. 2, 1983, 58-12749[U]
Int. Cl.³ B60G *11/26*
U.S. Cl. 280—712 **8 Claims**



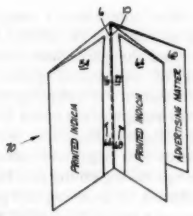
1. In a suspension system for vehicles equipped with a shock absorber comprising a cylinder supporting an axle, a piston fitted in the cylinder to divide the space therein into two chambers and having orifice passages to connect the two chambers, and a piston rod extending upward from the piston and supported by a car body at the upper end thereof, the improvement which comprises:
a main air-spring chamber coaxially disposed around said piston rod and cylinder to support the weight of a car;
an auxiliary air-spring chamber disposed above said main air-spring chamber and coaxially around said piston rod; and
a control rod disposed within said piston rod to extend in the longitudinal direction thereof in such a manner as to be displaceable with respect the piston rod;
that portion of the piston rod which surrounds the control rod having openings communicating with said main and auxiliary air-spring chambers;
the control rod having an air passage through which air is supplied to and discharged from the main and auxiliary air-spring chambers which are connected by the air passage and said openings in the piston rod;
the piston and control rods being adapted to function as a switch valve that selectively connects and disconnects the main and auxiliary air-spring chambers by displacing the control rod with respect to the piston rod; and
a silencing cover enclosing the upper end of the piston rod so that the outward leakage of the noise caused by the air flowing through the air passage in the control rod is reduced.

4,534,581

PRODUCT AND METHOD FOR USING AIRLINE TICKETS

Gordon L. Engh, Mission Viejo, Calif., assignor to Nekoosa Envelopes, Inc., Englewood, Colo.

Filed Dec. 14, 1983, Ser. No. 561,474
Int. Cl.³ B42D *1/00*
U.S. Cl. 281—15 R **10 Claims**



1. A ticket holder comprising:
a common page comprising first and second panels secured together and having a first fold line;
each of said first and second panels having a length and a width with said length being greater than said width;
said first fold line extending in a lengthwise direction;
a first ticket holder comprising third and fourth panels and joined to said first panel along a second fold line;
said third panel having a length and a width, each corresponding to said length and width of said first and second panels;
said fourth panel having a length approximately the same as the length of said third panel and a width less than the width of said third panel;
said third panel being joined to said first panel along said second fold line which fold line extends in a lengthwise direction;
said fourth panel being joined to said third panel along a third fold line extending in a lengthwise direction;
means securing said third and fourth panels along one widthwise edge so as to form a pocket between said third and fourth panels;
a second ticket holder comprising fifth and sixth panels and joined to said second panel along a fourth fold line;
said fifth panel having a length and a width, each corresponding to said length and width of said first and second panels;
said sixth panel having a length approximately the same as the length of said fifth panel and a width less than the width of said fifth panel;
said fifth panel being joined to said second panel along a said fourth fold line which fold line extends in a lengthwise direction;
said sixth panel being joined to said fifth panel along a fifth fold line extending in a lengthwise direction;
means securing said fifth and sixth panels along one widthwise edge so as to form a pocket between said fifth and sixth panels; and
each of said fold lines being independent.

4,534,582

ADHESIVE LABELS

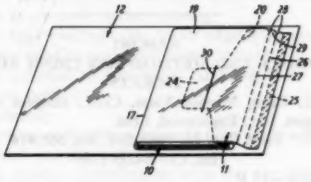
Robin G. Howard, Bury St. Edmunds, England, assignor to Denny Bros. Printing, Suffolk, England

Filed Apr. 28, 1983, Ser. No. 489,359

Claims priority, application United Kingdom, Apr. 28, 1982, 8212349

Int. Cl.[3] G09F 3/00; B42D 1/00

U.S. Cl. 283—81 6 Claims



1. An adhesive label comprising a sheet having a central portion which has an adhesive on its rear face and first and second flaps connected along fold lines to mutually opposite edges respectively of the central portion and extending towards each other and into overlapping relation, said flaps enclosing a leaflet or pamphlet anchored to said central portion, said first flap being overlapped by said second flap and having a tongue at its free edge, said second flap extending beyond the tongue and having on the rear face of its free edge portion a line of adhesive for fastening said portion down, said second flap also having a line of weakening adjacent said edge portion whereby the main part of the second flap can be separated from said edge portion to provide access to the leaflet or pamphlet, and said main part having a slit therein for receiving the tongue on the first flap to re-enclose the leaflet or pamphlet.

4,534,583

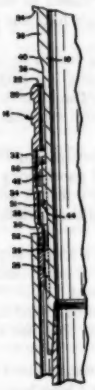
MUDLINE CASING HANGER ASSEMBLY

Lionel J. Milberger; Jimmy R. Martin, and Thomas P. Mataway, all of Houston, Tex., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 12, 1982, Ser. No. 441,190

Int. Cl.[3] F16L 35/00

U.S. Cl. 285—24 23 Claims



1. A casing hanger assembly for supporting a casing string within and from a tubular member comprising:

a vertically oriented cylindrical casing hanger body having,

a downwardly-facing load shoulder around a substantial protion of the periphery, and having a major diameter,

a first reduced diameter portion below said load shoulder,

a second and smaller reduced diameter portion below said first reduced diameter portion,

an intermediate section within said second reduced diameter portion extending radially outwardly and having a downwardly-facing push shoulder,

a latch engaging means secured radially outwardly of said second reduced diameter portion at the lower end thereof;

a diametrically compressible collet surrounding said casing body movable vertically between said load shoulder and said latch engaging means having,

radially outwardly extending support segments at an upper location on said collet for mating and supporting said collet from said tubular member, an upwardly-facing load shoulder above said support segments adapted to engage said downwardly-facing load shoulder,

radially outwardly-extending latches at the lower end of said collet engageable with said latch engaging means in the relaxed extended condition but not in the diametrically compressed condition, whereby said collet is engaged with said latch engaging means until it is compressed, said collet having a first and vertical flat on its outer diameter with a first diameter and having a radially inwardly-tapered portion therebelow, said collet having a second vertical flat on its outside diameter at a greater diameter than that of said first vertical flat and above said first vertical flat with a tapering portion joining said first and second flats,

said collet having a radially inwardly extending upwardly facing shoulder at the lower end engageable with said push shoulder;

the diameter of said first and second flats, said latch, said latch engaging means, said push shoulder and said inwardly-facing shoulder sized such that as said collet enters a casing and is diametrically reduced by squeezing the collet to the casing diameter the reduction of said first flat to the casing diameter produces a smaller diameter of said inwardly-facing shoulder than the diameter of said push shoulder but does not release said latch from said latch engaging means, and reduction of said second flat to the casing diameter fully releases said engaging means;

whereby said latch is disengaged as the taper joining said first and second flats enters the casing and said push shoulder thereby engages said collet to push the collet down the casing to the support elevation.

4,534,584

HYDRAULIC CONNECTING DEVICE

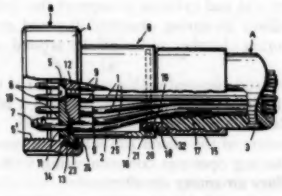
Walter Weirich, Dortmund; Jürgen Melis, Lünen, and Peter Wollenhaupt, Lünen-Horstmar, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 7, 1983, Ser. No. 464,258

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204102

Int. Cl.[3] F16L 35/00

U.S. Cl. 285—24 7 Claims



1. A hydraulic arrangement comprising a hydraulic multi-

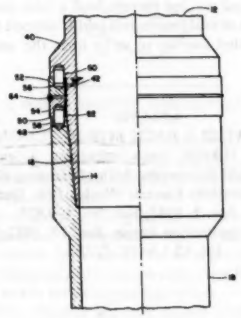
line hose, a hydraulic coupling device, and a hydraulic connecting device interconnecting the multi-line hose and the coupling device, the multi-line hose having a plurality of flexible hydraulic conduits housed within a protective sheath, the coupling device having a plurality of plug pins held within a casing by a retainer, and the connecting device comprising a first sleeve, a second sleeve having an end portion telescopically positioned around an inturned end portion of the first sleeve, and a releasable securing element for detachably connecting said end portions of the sleeves, the other end portion of the first sleeve being connected to the multi-line hose, and the other end portion of the second sleeve being connected to the coupling device, wherein the securing element is such as to permit relative rotation between the two sleeves and such as to resist tensile forces tending to separate the two sleeves, wherein the outer diameters of the first and second sleeves are substantially no greater that the outer diameter of the hose, wherein said end portions of the sleeves have a greater wall-thickness than the remaining portions thereof, and wherein the second sleeve has an axially-extending recess of limited circumferential extent formed in its inner wall extending from the other end portion to adjacent the first sleeve for accommodating a flange of a larger guide plug pin.

4,534,585

PIPE JOINT LOCKING DEVICE

Kenneth C. Saliger, DeSoto, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,780
Int. Cl.³ F16L *15/00*
U.S. Cl. 285—92 **4 Claims**



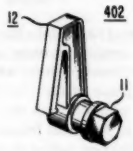
1. In a pipe joint for flowlines or well casings subjected to reversible rotation, said pipe joint including a tubular box and a tubular pin directly interconnected through a cooperating sealing screw thread formed at the adjoining ends of said tubular box and tubular pin, the improvement comprising locking means engaging said tubular box and said tubular pin about the joint intermediate said tubular box and pin; said tubular pin including an enlarged diameter end portion facing towards the connecting end with said tubular box, an annular recess formed at said tubular pin end so as to provide parallel spaced radial lands, one said radial land being the surface on said enlarged diameter end facing towards the connecting end with said tubular box, and the other radial land being the end surface of said tubular box facing said enlarged diameter tubular pin end portion; a pair of spaced annular ring members positioned in said recess so as to encompass said tubular pin and contacting said lands, one said ring members having at least one blind bore in axial alignment with at least one blind bore in said enlarged diameter tubular pin end portion, a dowel pin extending through said bores to fasten said ring member to said tubular pin; the other said ring member having at least one blind bore in axial alignment with at least one blind bore in the end surface of said tubular box, a dowel pin extending through said bores to fasten said other ring member to said tubular box; and means for fixedly interconnecting said rings to facilitate transmission of torque through said pipe joint.

4,534,586

AUTOMATIC LOCKING DEVICE

Arnold R. Smith, Chester, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 29, 1982, Ser. No. 454,158
Int. Cl.³ E05C *3/14*
U.S. Cl. 292—228 **2 Claims**



1. An automatic locking device for securing a first member to a second member comprising:

a latch member connected to the first member, the latch member upon attachment of the first member to the second member being inserted into a detent within the second member,

a spring member the spring member extending at an angle thereto, integral to the latch member, the spring member biased by a projecting member within the first member, and

a bolt member detachably connected to the latching member, the bolt member further comprising;

a head member at one end and a shank portion at the other end,

the head member being rotatable such that the latch member is outside of the detent, thereby facilitating the detachment of the first member from the second,

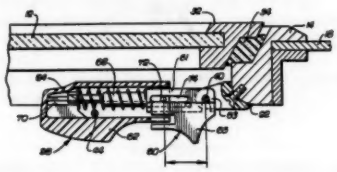
the head member further having a slot, the slot having predetermined boundaries for mating to a key within an opening in the first member, the slot boundaries are at an angle to each other approximately equal to said spring member angle, the slot thereby preventing the overstressing of the latch member when rotating the head member and the slot also providing the continuous biasing of the spring member with the projecting member.

4,534,587

LATCH ASSEMBLY

Paul D. Fleming, Glendale, Calif., assignor to W & F Manufacturing, Inc., Glendale, Calif.

Filed Jan. 28, 1983, Ser. No. 462,020
Int. Cl.³ E05C *17/32*
U.S. Cl. 292—263 **35 Claims**



1. A latch assembly for controlling movement between open and closed positions of a vent panel relative to a main frame in a sunroof window or the like, comprising:

a frame bracket for securement with respect to the main frame;

a pair of frame links;

means for pivotally connecting said frame links generally at one end thereof in transversely spaced relation with re-

spect to said frame bracket for generally coaxial pivoting movement;

a panel bracket for securement with respect to the vent panel;

a pair of panel links;

means for pivotally connecting said panel links generally at one end thereof in transversely spaced relation with respect to said panel bracket for generally coaxial pivoting movement;

means for pivotally connecting said frame links and said panel links respectively to each other generally at their respective other ends for generally coaxial pivoting movement;

said pairs of frame and panel links being sized and shaped for articulated over-center pivoting movement between a generally folded closed position with the vent panel lying generally in the plane of the vent frame and a generally end-to-end open position with the vent panel in an open position relative to the main frame;

each of said frame links including at least two longitudinally movable sections and a spring reacting therebetween urging said sections toward a fully extending position such that said frame links are adjustable in length during said articulated pivoting movement to limit the magnitude of forces reacting between said frame and panel brackets during such movement in accordance with the strength of said springs;

a handle member extending between said frame links at a position with said other ends of said panel links disposed between said handle member and said one ends of said frame links, said frame links and handle member cooperating to define passages through which said panel links extend when said frame and panel links are in said open position, and further including first tab means on said panel links interengageable with second tab means on said frame links and handle member for releasably locking said frame and panel links in said open position;

a spring-loaded latch carried by said panel bracket; and

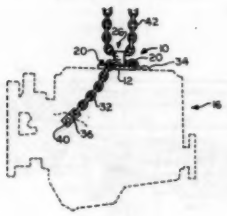
a latch keeper on said frame bracket, said latch and keeper being releasably interengageable when said frame and panel links are in said closed position to lock the vent panel in a closed position generally lying within the plane of the main frame.

4,534,588

ENGINE LIFTING TOOL

John W. Markey, 2713 Sorrell St., Baton Rouge, La. 70805

Filed Apr. 25, 1984, Ser. No. 603,682
Int. Cl.³ B66C *1/16*
U.S. Cl. 294—81.5 **17 Claims**



1. A lifting tool for lifting an internal combustion engine having an intake manifold connected thereto, said intake manifold having threaded holes or studs therein, comprising:

a. mounting plate means for connecting to the intake manifold of said engine, said mounting plate means having a plurality of holes therein aligned with threaded holes or studs in said intake manifold,

b. a "U"-shaped bracket means connected to said mounting plate means for receipt of lifting means connected to an engine hoist, and

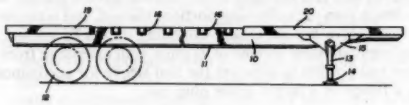
c. safety chain means connected to said "U"-shaped bracket means for connecting to said engine to prevent said engine from falling to the ground if said "U"-shaped bracket should separate from said mounting plate means or if said mounting plate means should separate from said engine while said engine is being hoisted.

4,534,589

UNITIZED TRAILER ASSEMBLY

Howard Booher, P.O. Box 277, Randolph, Ohio 44265

Filed Mar. 22, 1984, Ser. No. 592,078
Int. Cl.³ B62D *21/02*
U.S. Cl. 296—182 **6 Claims**



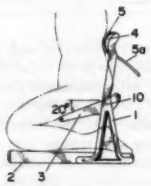
1. A unitized trailer structure consisting of a pair of horizontally spaced longitudinally extending vertically disposed beams having upper and lower portions, horizontally disposed longitudinally extending flanges on the lower portions of said beams, a plurality of cross sectionally U-shaped cross frame members positioned in longitudinally spaced transversely aligned notches in the upper portions of said longitudinally extending beams and welded thereto, and a floor positioned on the upper portions of said beams and said U-shaped cross frame members and welded thereto so as to form the unitized rigid structure.

4,534,590

CHAIR WITH A BACK FOR RECLINING

Yukio Yamamura, Hikone; Jingo Nakayama, Shiga; Atsunobu Ikeda, and Takashi Kawamoto, both of Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 1, 1983, Ser. No. 499,878
Claims priority, application Japan, Jun. 15, 1982, 57-102721
Int. Cl.³ A47C *7/72*
U.S. Cl. 297—180 **12 Claims**



1. A chair which may be used either as a squat chair or a conventional chair comprising:

a frame member, said frame member having a cross-bar portion at its upper end and a pair of side bars extending downwardly from respective ends of the cross-bar portion, said cross-bar portion being located so as to abut against the waist region of the back of a person sitting on the chair, thereby supporting the lumbar region of the person's spine;

a seat member, said seat member being pivotally supported at opposite sides thereof on respective side bars of said pair of side bars;

pivotal support means, said support means pivotally supporting the seat member on the frame member so that the seat member is freely forwardly downwardly inclinable, said

support means including means for limiting the angle of downward inclination of the seat member;

a substantially planar base, said base being attached to the side bars of the frame member at the lower ends thereof; and

further comprising a lumbar supporting protruding portion at the rear bottom portion of the seat member, said protruding portion being located so as to abut against the waist region of the back of a person sitting on the base when the seat member is in an upright position, thereby supporting the lumbar region of the person's spine.

4,534,591

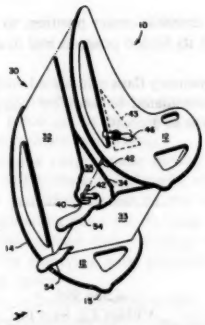
CONTROLLED ROCKING ACTION FURNITURE

Michael S. Parker, Rte. 185, Sorrento, Me. 04677

Filed Oct. 12, 1982, Ser. No. 433,905

Int. Cl.³ A47C *3/02*

U.S. Cl. 297—270 **17 Claims**



1. Rocking action furniture with upright stop mechanism comprising:

curved side pieces for rocking engagement with the ground;

seat frame means spacing and joining the curved side pieces, said seat frame means defining an operating space near the base of the furniture;

axle pivot means extending across the inner operating space and supported at respective ends by said side pieces, and handle means for rotating the axle pivot means;

eccentric mounting arm means extending from the axle pivot means in the inside operating space;

at least one elongate leg stop means pivotally mounted at one end to the end of said eccentric mounting arm means away from the axle pivot means so that both pivoting motion and translating motion are imparted to the elongate leg stop means upon rotation of the axle pivot means;

said seat frame means formed with at least one slot near the base of the seat frame means in alignment with the eccentric mounting arm means and leg stop means, said slot extending between the operating space and the outside of said seat frame means;

said leg stop means constructed and arranged with its free end extending through the slot so that rotation of the axle pivot means and extending cam means causes the leg stop means to pivot and translate for extending and retracting through the slot between a position substantially within the operating space and a position extending outside the seat frame means in contact with the ground when the rocking action furniture is in upright position; and

locking means for locking the leg stop means in extended position for stopping the rocking action furniture in said upright position, said locking means comprising a flat locking shelf formed on the upward side of said leg stop means, said locking shelf formed at a substantially complementary angle to a portion of the seat frame means defining an edge of the slot whereby at least a portion of the weight of said furniture is directed through an edge of the slot onto the locking shelf locking the leg stop means in place by the weight of said furniture bearing on the locking shelf and whereby the downward force of said furniture is transmitted to the axle pivot means through the leg stop means and eccentric mounting arm means thereby locking said furniture in upright position with the leg stop means extended.

4,534,592

LUMBAR SUPPORT ADJUSTING APPARATUS

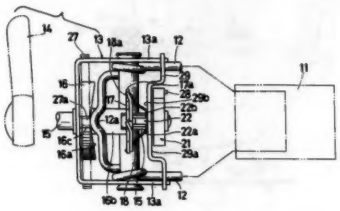
Takemi Hattori, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 30, 1983, Ser. No. 480,574

Claims priority, application Japan, Apr. 6, 1982, 57-57050

Int. Cl.³ A47C *3/00*

U.S. Cl. 297—284 **6 Claims**



1. An apparatus for adjusting a lumbar support having a lumbar plate held against a seat back, comprising:

(a) a bracket;

(b) a torsion bar having an end connected to said lumbar plate for applying force to said lumbar plate, said lumbar plate also having an opposite end being angularly movable and supported on said bracket, said opposite end having a cam follower projection;

(c) a handle-operated shaft rotably mounted on said bracket;

(d) means for rotating said shaft;

(e) a cam rotably mounted on said shaft and having a shank, a cam face engaging said cam follower projection and a plurality of recessed members on the outer peripheral surface thereof,

(f) a leaf spring having a locking projection for individual engagement with said recessed members on said cam;

(g) a ratchet mounted on said shank and having a plurality of radial teeth;

(h) a release plate mounted on said shaft, said release being axially movable therewith and having a plurality of pawls engageable with said radial teeth for turning said cam in response to rotation of said shaft thereby adjusting the force on said lumbar plate applied by said torsion bar;

(i) a support plate mounted on said bracket, said shaft having one end projecting through said support plate;

(j) a torsion spring having one end secured to said one end of said shaft and the other end connected to said support plate; and

(k) compression means for urging said release plate against said ratchet.

4,534,593

VEHICLE SEAT LUMBAR SUPPORT INSERT AND METHOD OF UTILIZING THE SAME

William K. Ojala, Dearborn Heights, Mich., assignor to Practical Technology Incorporated, Birmingham, Mich.

Filed May 6, 1983, Ser. No. 492,191

Int. Cl.³ A47C *7/46*

U.S. Cl. 297—284 **9 Claims**

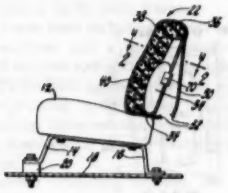
1. A vehicle lumbar support adapted to be inserted into a vehicle seat back structure having a resilient cushion element and a substantially vertically extending frame for supporting

said cushion element, said frame comprising a perimeter formed to receive and retain a cushion, said frame having an open upper section defined by a portion of said perimeter and extending downwardly from upper portions of said perimeter, said support comprising;

a lumbar support member;

said lumbar support member having a front face portion shaped to provide support to the lumbar region of a person seated in front of and bearing against a said cushion element;

said lumbar support member furthur having a second face, a recess formed in said second face of said lumbar support member, said recess having a lower ledge and an upper ledge, both said ledges extending inwardly from said second face of said lumbar support member; and a support bar having a tenon-like section sized to snugly fit into said recess and bear vertically against both said ledges;



said support bar having a portion extending outwardly from said tenon-like section a distance sufficient to extend outwardly from said support member second face when said tenon-like section is snugly fitted into said recess, the latter said support bar portion forming a stop member adapted to extend between parallel portions of a said perimeter of a said frame within a said open section to form a stop limiting movement of said lumbar support member transversely of said parallel portions of a said perimeter when received between said parallel portions of a said perimeter with said support bar received snugly within said recess with said stop member projecting outwardly of said lumbar support member, and when said stop member is centrally positioned laterally of said parallel portions of said perimeter, with said support member positioned between a cushion element supported by a said frame and a latter said frame.

4,534,594

LEG-REST, NOTABLY FOR TRANSPORT VEHICLES AND ESPECIALLY FOR AEROPLANES

Staub Lucien, Paray-Vieille-Poste, France, assignor to The National Company Air France, Paris, France

Continuation of Ser. No. 355,360, Mar. 8, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 677,321

Claims priority, application France, Mar. 16, 1981, 81 05255

Int. Cl.³ A47C 7/52

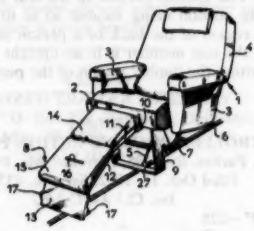
U.S. Cl. 297—438 **14 Claims**

1. Foldable leg-rest assembly removably connectable to a horizontal underseat luggage-restraining cross bar of a vehicular seat of the type employed in airliners and passenger railway cars, without need to modify the seat for installation or removal of the leg rest assembly, comprising

a non-swinging frame to be removably coupled to said cross bar, said non-swinging frame including a pair of substantially vertical side plates joined at their lower ends by a horizontal member, the side plates being parallel and each having an integral downwardly extending finger at a rear side thereof to define a substantially vertical cut out to overfit said cross bar, and including a plate member joining rearward edges of said fingers, leaving open a top side and a front side of said non-swinging frame to receive other portions of said leg-rest assembly in a folded position thereof;

a first flap pivoted on said non-swinging frame;

a holding device linking said first flap and said non-swinging frame and automatically holding said first flap on each



side of an unstable center position, to maintain stably the first flap in its folded position and in an opened-out position; and

three supplementary flaps articulated with each other, one of which is articulated to said first flap, and a last one of which serves as a prop.

4,534,595

VEHICLE SEAT

Tadafumi Abe, and Isao Takahashi, both of Tokyo, Japan, assignors to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 453,939

Claims priority, application Japan, Dec. 29, 1981, 56-214674; Dec. 29, 1981, 56-196505[U]; Dec. 29, 1981, 56-196839[U]; Apr. 30, 1982, 57-73565

Int. Cl.³ A47C 7/02

U.S. Cl. 297—452 **19 Claims**

1. A vehicle seat comprising: (a) a pad member having an upper surface and at least one depression along said upper surface;

(b) adhesive material positioned on each said at least one depression;

(c) a top member having a substantially flat underside, said top member being attached to said upper pad surface along said depressions by said adhesive material, said top member being pushed into each said at least one depression, wherein said adhesive material is applied only to said pad member depressions; and

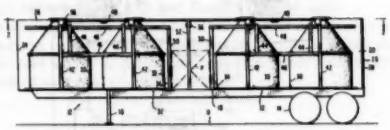
(d) at least one decorative crease formed in an upper surface of said top member at each portion of said top member which is pressed into each said at least one depression.

4,534,596

FREIGHT VEHICLE WITH A CONVERTIBLE CARGO SPACE

Timothy C. Bonerb, East Amherst, N.Y., assignor to Vincent C. Bonerb, Boston, N.Y.

Filed Mar. 30, 1983, Ser. No. 480,499
Int. Cl.³ B60P 1/56
U.S. Cl. 298—27 16 Claims



1. A freight vehicle having a cargo space convertible from a space suitable for piece goods to a space suitable for bulk granular aterial, the vehicle comprising;

(a) means defining a cargo space having a load-bearing bottom floor, side walls and end walls, and a roof,

(b) door means providing access to the cargo space for loading and unloading piece goods cargo therein,

(c) means defining at least two discharge openings in the bottom floor for emptying bulk, granular material cargo from the cargo space,

(d) at least two inflatable double-walled, generally cup-shaped bags for containing bulk cargo, each bag having an opening in its bottom positioned to register with one of the openings in the floor of the cargo space, each bag having a width dimension when the space between the bag walls is inflated less than the distance between the cargo space side walls so that none of the bags contact the cargo space side walls,

(e) a rigid bag bottom support platform means having openings therethrough in registery with the discharge openings in the bags and in the floor, the platform means positioned beneath the bag bottom, secured to the bag bottom and resting on and transmitting the weight of bulk cargo in the bag to the floor and not to the side walls when the cargo space is used in a bulk material handling mode,

(f) means for raising and lowering the bag bottom support platform means from the floor of the cargo space to a position with the bag support platform adjacent to the roof of the cargo space with the bag collapsed, to thereby convert the cargo space to space suitable for piece goods handling,

(g) mechanical means on the cargo space side walls for maintaining the bag in an erected position when the bag support platform means is on the floor and the cargo space is in the bulk handling mode, and for maintaining each bag spaced from the cargo space side walls during operation of the raising and lowering means,

(h) a fill opening means in the roof of the cargo space,

(i) a flexible member means connected to the fill opening means and connected to the top of each bag to provide an enclosure for the area around the fill opening means to the top of each bag,

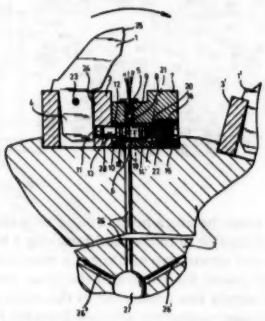
(j) means for inflating and deflating the space between the walls of each bag, the inflation causing expansion of the inner wall from the top downward to assist in gravity discharge of the granular bulk material after its angle of repose is reached.

4,534,597

MINING TOOL WITH AUTOMATIC SPRINKLER CONTROL

Franz Kemper, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,585
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3234993
Int. Cl.³ E21B 10/60
U.S. Cl. 299—81 4 Claims



1. A mining tool comprising:

a generally cylindrical body rotatable about an axis;

a plurality of cutters peripherally spaced on said body and provided each with a working edge facing in the direction of rotation, each cutter further having a shank mounted on said body with freedom of limited pivotal motion in a plane substantially perpendicular to said axis;

conduit means connected to a supply of water under pressure, said conduit means including a channel terminating at an outlet in the vicinity of each of said cutters;

nozzle means in said outlet for sprinkling water onto a mine face attacked by said working edge;

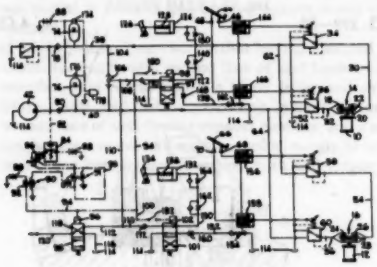
valve means interposed between said channel and said outlet for significantly reducing the flow of water to said nozzle means in a normal blocking position, said valve means including a piston in contact with and generally perpendicular to said shank; and

biasing means acting upon said shank to urge said working edge forward in the direction of rotation, said piston being displaceable by said shank from said normal position into an unblocking position upon repression of said working edge against the force of said biasing means by contact with said mine face, said shank being pivotally mounted in a holder provided with a bore generally perpendicular thereto, said channel and said outlet communicating with said bore, said piston being movable in said bore, said biasing means comprising a spring bearing upon said shank through the intermediary of said piston, said bore having an end remote from said shank provided with removable closure means, said spring being inserted in a space between said piston and said closure means, said piston having a passage aligned with said channel and said outlet in said unblocking position but cut off from said outlet in said normal position, said passage having an extension permanently connecting said channel with said space whereby water entering said passage from said channel in said normal position exerts pressure upon said piston supplementing the spring force.

4,534,598
HYDRAULIC DISK BRAKE CIRCUIT FOR CRANE DRAW WORKS

Leon L. Cuhel, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Filed Apr. 22, 1983, Ser. No. 487,639
Int. Cl.[3] B60T *13/14*
U.S. Cl. 303—10 7 Claims



1. In a crane having a hoist drum, a wire rope wound on said drum and capable of raising and lowering a load in response to winding and unwinding said rope, a reservoir and a pump; an improved system for control of the drum comprising:

a fluid supply line connected to the output of said pump;

a disk brake engageable with the drum for frictionally arresting movement of the drum in response to receiving fluid under pressure;

a brake valve for directing fluid pressure from the pump to said brake;

a pawl biased toward engagement with the drum to lock the drum from unwinding rotation;

a pawl cylinder connected to said pawl and responsive to fluid pressure to disengage said pawl from said drum;

an accumulator teed into said supply line;

a check valve in said supply line for isolating said pump when accumulator exceeds pump pressure;

a first solenoid valve when energized directing fluid pressure to said pawl cylinder and when de-energized connecting said pawl cylinder to reservoir and directing fluid pressure to said disk brake;

a pressure-sensing electrical switch; and

electrical circuit means connecting said switch to said solenoid valve to energize the same when the pressure developed by said pump falls below a predetermined value;

whereby said brake arrests rotation of said drum and said pawl engages said drum to prevent lowering of the load in response to pump pressure falling below said predetermined value.

4,534,599
ELECTRO-HYDRAULIC BRAKE CONTROL SYSTEM FOR A TRAIN

Eric C. Wright, Watertown, and Ronald E. Fairman, Adams, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.

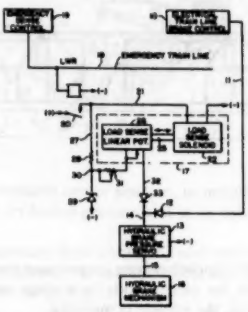
Filed Nov. 26, 1982, Ser. No. 444,548
Int. Cl.[3] B60T *8/18*
U.S. Cl. 303—22 R 4 Claims

1. An electric train line brake control system for governing power operation of brakes of a plurality of vehicles of a train comprising electro-hydraulic brake control means for each vehicle effective to govern braking pressure in inverse proportion to the degree of energization of said brake control means such that braking pressure is increased for an increased load wherein the improved electro-hydraulic brake control means comprises:

(a) load sense signal generating means operable in response to designation of emergency braking to generate a signal continuously variable for governing the electro-hydraulic brake control means in a continuously variable manner in accordance with the load of the vehicle, the load sense signal generating means comprising;

(1) a normally deenergized emergency train line connecting the vehicle of the train for energization to govern the brake control means on each vehicle,

(2) emergency sense control means for energizing the emergency train line upon sensing an emergency brake control designation,



(3) a lever for sensing vehicle load by measuring a degree of deflection of springs of the vehicle as an indication of load,

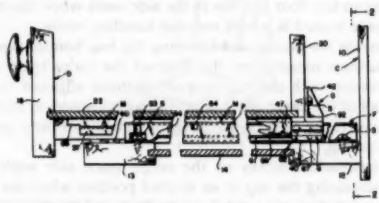
(4) solenoid means responsive to energization of the emergency train line for activating the lever, and

(b) means including a linear potentiometer actuated jointly by the lever and the solenoid means for generating the load sense signal so as to vary inversely as the load of the vehicle for governing the hydraulic brake control means.

4,534,600
DRAWER SLIDE ASSEMBLY

Peter A. Cosme, R.R. 1, Box 119, Lockport, Ill. 60441

Filed Jan. 20, 1984, Ser. No. 572,551
The portion of the term of this patent subsequent to Jun. 21, 2000, has been disclaimed.
Int. Cl.[3] F16C *29/02*
U.S. Cl. 308—3.6 11 Claims



1. A drawer slide assembly for a cabinet having a cavity and a drawer slidably seated therein, comprising

(a) a first channel member adapted to be affixed to a cavity wall and comprised of a bottom web and lateral walls extending normally therefrom and terminating, to a major extent longitudinally in inwardly extending flanges, said bottom web having a central longitudinally extending elevated ridge along the major length thereof,

(b) a second channel member adapted to be affixed to a drawer for nesting and sliding movement within said first channel member and terminating at its leading rear end in a sleeve-like portion,

(c) a low friction body comprising a vertical member adapted to be affixed to the rear wall of said drawer and a bar member projecting forwardly from said body and insertable within the rear end of said sleeve portion for limited relative movement therein, said body including a base portion having a longitudinally extending recess at the bottom thereof overlying said ridge in said first channel member,

(d) lateral protuberances on the said base portion of said body on the opposite sides of said last-mentioned recess adapted for sliding movement within the spaces in said first channel member on the opposite sides of said ridge and between said web and flanges thereof, and

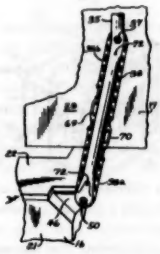
(e) a sloping bridge extending from the rear end of said base portion to said vertical member to facilitate insertion of the rear end of said second channel member into the front end of said first channel member.

4,534,601

LIFT ASSEMBLY FOR MOVABLE CABINET

David J. Zwick, Stoystown, Pa., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed Feb. 16, 1984, Ser. No. 580,654
Int. Cl.³ A47B *49/00*
U.S. Cl. 312—266 **13 Claims**



1. In a vehicle having first and second cabinets, the first cabinet being supported by a floor of the vehicle and the second cabinet being movable between a use position above the first cabinet and a storage position below the use position, the improvement comprising a first wheel non-rotatably mounted on the first cabinet with the axis thereof extending generally horizontally and generally perpendicularly to the direction in which the second cabinet moves, a second wheel non-rotatably mounted on the second cabinet with the axis thereof extending generally horizontally and generally perpendicularly to the direction in which the second cabinet moves, a link rotatably connected to the first and second cabinets adjacent the first and second wheels and extendings therebetween for supporting the second cabinet as it moves between the use position and storage position, and cable means extending around the first and second wheels and engageable with the wheels for maintaining the wheels in a substantially constant angular relationship as the second cabinet moves between the use position and the storage position whereby the second cabinet is maintained in a substantially upright position as it moves.

4,534,602

R.F. MULTI-PIN CONNECTOR

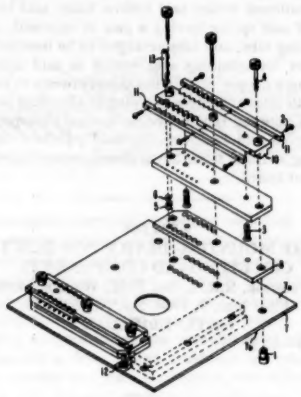
David W. Bley, Mountain View, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed May 26, 1982, Ser. No. 382,280
Int. Cl.³ H01R *23/68*
U.S. Cl. 339—14 R **12 Claims**

1. A coaxial connector for electrically connecting a plurality of conductive regions via a plurality of controlled impedances comprising:

a compressible conductive frame serving as the outer conductor and having a first plurality of holes formed therethrough, said compressible conductive frame not including a solid metal conductor in close proximity to said plurality of conductive regions;

a tubular insulator located within each of said first plurality of holes; and



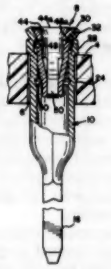
a compressible conductive inner conductor located within each said tubular insulator, said compressible conductive inner conductor not including a solid metal conductor, thereby providing a coaxial connector requiring no insertion or removal force, whereby electrical connection is made by causing said conductive regions to abut said frame and said inner conductors.

4,534,603

ASSEMBLY OF A CONTACT SPRING AND WIRE WRAP TERMINAL

Vincent B. Brown, Prospect Heights, and Lawrence Geib, Elmwood Park, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed May 25, 1983, Ser. No. 498,058
Int. Cl.³ H01R *4/09, 13/15*
U.S. Cl. 339—17 C **11 Claims**



1. A two-piece socket terminal assembly for a circuit board comprising:

a terminal member having an upper hollow body, a peripheral portion for mounting on a circuit board, and a lower terminal end,

a contact spring having a hollow portion to form an upper pin receiving socket, said hollow portion being mounted within the opening of said hollow terminal body,

said spring further including a plurality of resilient contact fingers extending from said hollow portion downward into said hollow body to engage a pin on an electrical component inserted therein, and

said terminal portion and said contact spring being separately fabricated by stamping and forming techniques,

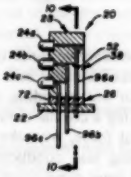
said terminal portion also including a pair of opposed recesses positioned within said hollow body, said hollow portion of said spring having a pair of opposed, outwardly extending tabs, said tabs arranged to be inserted into said recesses for retaining said spring in said terminal and creating a proper orientation therebetween to insure mating with sides and edges of a plug-in electrical device, said pair of opposed recesses being formed by a punched out portion of said hollow body, said punched out portion forming an outer tab to aid in the mounting and support on a circuit board.

4,534,604

VERTICAL MOUNTING DEVICE FOR ELECTRICAL CIRCUIT BOARD COMPONENTS

Steven G. Peterson, R.R. 2, Box 202C, Waseca, Minn. 56093

Filed Mar. 9, 1984, Ser. No. 588,045
Int. Cl.[3] H01R *23/72*
U.S. Cl. 339—17 D 3 Claims



1. A mounting device for the upright mounting, on a printed circuit board or the like, of electrical components having electrical leads, comprising:

a base portion adapted for operable coupling with said board, including:

a base plate adapted to be affixed to said board, said plate including a plurality of spaced apart base plate apertures for receiving said leads;

a pair of opposed, resilient sidewalls extending upwardly from said base plate, each of said base plate sidewalls including a beveled upper edge and structure defining latch receiving apertures;

an upright portion snapably received by said base portion, said upright portion including:

a front wall;

a rear wall in opposed relationship with said front wall, said rear wall defining a plurality of stepped portions;

structure defining a plurality of upright portion apertures extending between said front wall and said rear wall for receiving said electrical leads, said upright portion apertures being longitudinally spaced apart relative to said upright portion front wall for maintaining said leads in spaced apart relationship,

said upright portion apertures intersecting said rear wall at different ones of said stepped portions whereby the leads extending through said upright portion apertures beyond said rear wall can be bent about said stepped portions into generally parallel relationship with said front wall while maintaining their spaced apart relationship; and

opposed sidewalls, each sidewall having an upper portion and a lower portion recessed relative to said upper portion, said sidewall lower portions each including an outwardly extending snap element having an inclined bottom wall,

said snap element bottom wall and said base plate sidewall beveled upper edge being of generally equal slope for mutual sliding engagement upon insertion of said upright portion into said base portion,

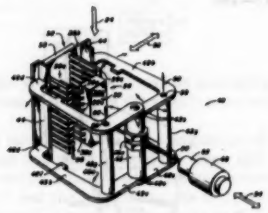
said snap elements being snapably received within said base portion sidewall apertures, and respective ones of said base portion sidewalls and said upright portion sidewall upper portions being generally aligned so as to collectively define opposed, generally planar, mounting device sidewalls, when said upright portion is snapably received within said base portion.

4,534,605

SYMMETRICAL, SINGLE POINT DRIVE FOR CONTACTS OF AN INTEGRATED CIRCUIT TESTER

Nicholas J. Cedrone, Wellesley Hills, and Kenneth R. Lee, Lincoln, both of Mass., assignors to Daymarc Corporation, Waltham, Mass.

Filed May 23, 1983, Ser. No. 497,206
Int. Cl.[3] H01R *13/629*
U.S. Cl. 339—75 M 9 Claims



1. A drive system for flexing the free ends of two parallel, spaced apart rows of contacts in a contact assembly into electrical connection with two generally parallel rows of leads of an integrated circuit that is positioned at a test site between the rows of contacts, said flexing occurring generally along a first lateral direction and said leads each extending generally in a second direction perpendicular to the first direction, comprising,

drive means that produces a linear movement generally along said second direction, generally along an axis of symmetry for said drive system, and away from said integrated circuit,

a pair of push bars that each extend in a third direction perpendicular to said first and second directions and adapted to be positioned on opposite sides of and adjacent to said two parallel rows of contacts, and

a pair of actuator arms each mounted for a rotating movement about a fixed axis and extending generally in said second direction, each of said fixed axes being laterally offset from said axis of symmetry generally in said first direction, each of said arms having a free end that mounts one of said push bars and a driven end, said free and driven ends lying on opposite sides of said fixed axis of rotation, and

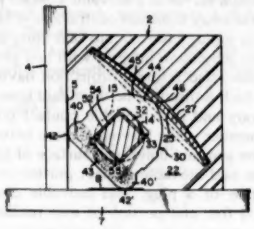
means for operatively coupling said drive means simultaneously to both of said actuator arms at their driven ends so that said linear movement of said drive means is converted into a symmetrical reciprocating movement of said push bars, generally along said first direction, between a retracted position where said contacts are spaced from said leads and a flexed position where said contacts are each in electrical connection with an associated one of said leads, wherein said coupling means comprises an unguided, flexible cord.

4,534,606

CONNECTOR FOR PRINTED CIRCUIT BOARDS

Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 519,449, Aug. 2, 1983, abandoned. This application Jun. 29, 1984, Ser. No. 626,351
Int. Cl.³ H01R 9/09
U.S. Cl. 339—75 M 9 Claims



1. Connector for interconnecting first and second substantially parallel rows of uniformly spaced surface contacts on respective first and second surfaces at substantially right angles to each other comprises:

an elongate dielectric housing having a first face for mounting against said first surface over said first row of surface contacts and a second face for mounting against said second surface over said second row of surface contacts, said second face being substantially perpendicular to said first face, said housing having a plurality of parallel planar recesses therein, each said recess extending into said first face and said second face and continuously therebetween, said recesses being spaced as said surface contacts and defining parallel planar barriers therebetween, said housing having an axial opening therethrough which intersects said barriers perpendicular thereto,

spring means disposed in each said recess opposite the intersection of said first and second faces,

a keying shaft passing coaxially through said opening, said shaft being profiled to rotate in said opening, said shaft having parallel planar keying surfaces,

a plurality of plate cams disposed in respective recesses, each said cam having an aperture therethrough, said shaft passing through each said aperture, said aperture having parallel keying walls which parallel the central axis of the cam on opposite sides thereof and accommodate said keying surfaces of said shaft, said apertures being sufficiently elongate to permit linear translation of said keying walls parallel to said keying surfaces, each said cam having first and second contact surfaces on the periphery thereof on opposite sides of said central axis at respective first and second faces of said housing and a bearing surface on the periphery thereof intersected by said central axis opposite said first and second contact surfaces, each said plate cam having lobe means on the periphery thereof, said lobe means being situated to bring said spring means to bear against said bearing surface as said keying shaft is rotated in said housing from a disengaged to an engaged position, whereby,

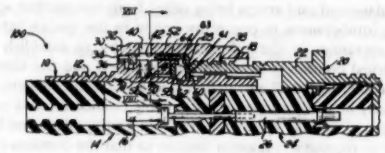
upon rotating said shaft from said disengaged to said engaged position when said first and second faces have said first and second surfaces thereagainst said cams will translate parallel to said keying surfaces and said contact surfaces will be urged against said surface contacts on said surfaces at respective first and second contact points.

4,534,607

CONNECTOR ASSEMBLY AND COUPLING RING

Vladimir Tomsa, Chicago, Ill., assignor to Allied Corporation, Morristown, N.J.

Filed Jun. 4, 1984, Ser. No. 616,873
Int. Cl.³ H01R 13/623
U.S. Cl. 339—89 R 11 Claims



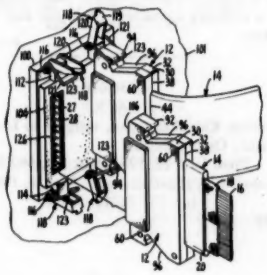
1. A two-part electrical connector including a rotatable coupling member carried by one part for engaging the other part, comprising a detent sleeve carried by one part and coupled to said coupling member, normally inoperative ratchet means engageable between said one part and said detent sleeve for resisting rotation of the coupling member, said ratchet means being adapted to become operable only when the two parts approach a fully mated condition by rotation of the coupling member in a mating direction, and indicating means associated with the ratchet means for indicating that the fully mated condition exists, said detent sleeve including a key having a longitudinal slot, said coupling member includes an opening therethrough and a longitudinal keyway which receives the key, and said indicating means includes an indicator member that is slidably received in said slot for reciprocating from a first non-indicating position and concealed from the opening in the coupling member and to a second indicating position and visible through the opening.

4,534,608

SHIELDED CONNECTOR SHELL FOR FLAT CABLE

Fred J. Scott, Sunnyvale, and Gary W. Walker, Cupertino, both of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed May 21, 1984, Ser. No. 612,224
Int. Cl.³ H01R 13/631, 13/658
U.S. Cl. 339—91 R 7 Claims



1. A connector shell for a shielded flat cable termination comprising first and second complemental matable members formed of rigid electrically conductive material, means for joining said members in assembled relation on a parting plane, said members defining a cable end and a connector end opposite from said cable end, said members forming a continuous passage through said connector shell between said ends, said passage adjacent said cable end defining strain relief means, said strain relief means including a plurality of ribs oriented transversely of said passage projecting inward of each said member, respective said ribs being transversely aligned and

having confronting edge lines confronting each other in spaced apart relation by a distance such as to grip flat shielded cable therebetween, said connector having inward of said strain relief means a region constituting shield contacting means, said shield contacting means including first and second arrays of spaced apart generally conical protuberances extending into said passages from respective said members, the inner extremities of said conical protuberances extending beyond said parting plane and said arrays being offset from one another so that the protuberances in one array reside in the spaces between protuberances in the other array thereby to establish firm electrical continuity between said members and the shield in said cable, said shell also defining adjacent said connector end a cavity in said passage for a flat cable connector, said cavity being substantially symmetrical of said parting plane and being sized to receive a connector therein so that the contacts in the connector are accessible through said connector end.

4,534,609

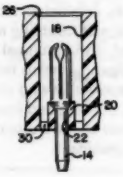
ELECTRICAL CONNECTOR BLOCK

Johnnie W. White, Streamwood, Ill., assignor to Bally Midway Mfg. Co., Franklin Park, Ill.

Filed Aug. 22, 1983, Ser. No. 524,987

Int. Cl.³ H01R *13/52*

U.S. Cl. 339—117 R **8 Claims**



1. A multi-terminal connector block comprising a body member having a plurality of openings or sockets extending from a surface thereof and terminating short of an opposed surface to define a base wall, support means on said base wall in each of said sockets for supporting a terminal pin in each socket, said base wall having openings extending therethrough to provide a liquid flow-through system whereby any liquid utilized as a cleaning agent will drain out and not accumulate in the sockets.

4,534,610

JACK

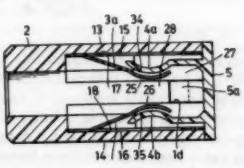
Yukio Takihara, Kaizuka, Japan, assignor to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Feb. 15, 1984, Ser. No. 580,301

Claims priority, application Japan, Mar. 4, 1983, 58-32049[U]

Int. Cl.³ H01R *13/187*

U.S. Cl. 339—206 P **5 Claims**



1. A jack comprising:

(a) a box-shaped body made of insulating synthetic resin, said body having a rear open end and a front face which is remote from said open end and which has a bore therein for the insertion and removal of a plug;

(b) a lid plate for closing the rear open end of said body;

(c) an elongated contact member having one end thereof fixedly mounted inside said body near said bore at a location that is spaced from the central axis of said bore, said contact member extending from its said fixed end towards said lid plate and being oriented to extend away from an inner wall surface of said body and toward the central axis of said bore, said contact member having a distal end portion which serves as a movable contact portion that is displaceable away from said central axis of said bore when engaged by a plug inserted into said bore; and

(d) a resilient projection integral with and projecting from said lid plate, said resilient projection having a free end portion which is disposed between said inner wall surface of said body and said movable contact portion of said contact member while leaving a space between said free end portion and said inner wall surface of said body such that, when said movable contact portion is displaced by the insertion of a plug, said movable contact portion pushes said free end portion of said resilient projection into resilient engagement with said inner wall surface of said body.

4,534,611

CONTACT SPRINGS

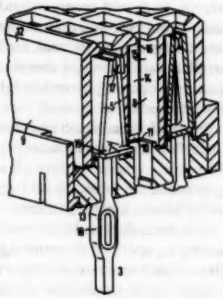
Artur Wohlfart, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich

Continuation of Ser. No. 388,181, Jun. 14, 1982, abandoned. This application Aug. 27, 1984, Ser. No. 645,514

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1981, 8118274[U]

Int. Cl.³ H01R *13/428*

U.S. Cl. 339—217 S **4 Claims**



1. A contact spring assembly for mounting in an insertion chamber of a housing having detachable upper and lower parts containing respective upper and lower portions of said insertion chamber, said contact spring assembly comprising a symmetrical contact spring part, having a planar base plate and a pair of like spring legs upstanding from opposed sides of said base plate, and a connection pin welded at its upper end flush to the undersurface of said base plate and extending longitudinally with the upstanding course of said spring legs, said base plate having symmetrical, opposed end flanged surfaces projecting laterally outward from corresponding adjacent edges of said spring legs for being supported in corresponding recesses defined between corresponding surfaces on said upper and lower parts in said housing against longitudinal movement in said chamber such that said contact spring part is contained in said chamber and said connection pin free end projects out of said housing, wherein said upper portion of said insertion chamber has opposed, laterally inward projecting ribs, each rib defining at its lower end an upper edge to the corresponding

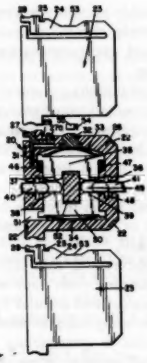
recess and along its opposed sides guide edges for travel projections formed on the free ends of said spring legs, said flanged surfaces being held against upward longitudinal movement by said lower ends of said ribs.

4,534,612

CURRENT CONNECTING DEVICE FOR THE ESTABLISHING OF ELECTRICAL CONNECTION BETWEEN CONDUCTORS

Joergen Loegstrup, Snekkersten, and Preben C. Sparre, Espergaerde, both of Denmark, assignors to A/S Loegstrup-Steel, Snekkersten, Denmark

Filed Aug. 5, 1983, Ser. No. 520,722
Claims priority, application Denmark, Aug. 18, 1982, 3692/82
Int. Cl.³ H01R *13/16*
U.S. Cl. 339—255 P **8 Claims**



1. A current connecting clip line of modular construction, for establishing electrical connection between rail-like conductors comprising, at least one contact clip having at least one electrically conducting coupling piece movably maintained within an insulating housing formed so as to completely enclose the at least one coupling piece, said housing including at least one slot for receiving a rail-like conductor and wherein said at least one coupling piece may contact said conductor when said conductor is received in said slot, a coupling stud having two ends and being located generally within said housing and being in operative contact with said at least one coupling piece at one end, and accessible from outside said housing at its other end, said stud being externally movable to adjust the position of said coupling piece relative said slot, so that biasing of said stud effectively insures proper contacting between said coupling piece and the rail-like members.

4,534,613

RECEPTACLE TERMINAL HAVING LOCKING LANCE

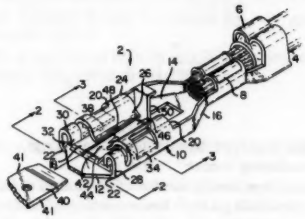
Wilhelm C. J. Esser, Tilburg, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 31, 1983, Ser. No. 547,277
Int. Cl.³ H01R *13/12*
U.S. Cl. 339—258 S **3 Claims**

1. An electrical receptacle terminal which disengageably receives a rectangular tab terminal having parallel side edges, the receptacle terminal having a mating end and an inner end, a flat web portion extending from the mating end to the inner end, the web portion having side edges and having contact springs extending from the side edges, the contact springs extending normally from the side edges and being formed inwardly towards each other and towards one surface of the web, the contact springs having marginal free end portions which are spaced from the one surface of the web by a distance which is less than the thickness of the tab whereby upon movement of the tab terminal into the receptacle, the free edge portions of the springs will press the tab against the web, the electrical receptacle terminal being characterized in that:

a first pair of tab positioning ears are provided at the mating end of the terminal and a second pair of tab positioning ears are provided intermediate the ends of the terminal, the first and second pairs of positioning ears being effective to engage the side edges of an inserted tab and locate the tab centrally on the web,

the first pair of tab positioning ears comprising flanges extending normally from the side edges of the web, the flanges being reversely bent and having end portions



which extend towards the web, the flanges having opposed parallel guiding surfaces which guide the tab onto the web during insertion,

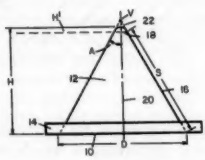
the contact springs extend from the side edges of the web intermediate the ends of the web, the second pair of positioning ears being struck from the contact springs and extending from the side edges of the web inwardly thereof and towards each other, the second pair of positioning ears having opposed guiding edges at their free ends which are co-planar with the guiding surfaces of the first pair of positioning ears.

4,534,614

ASPHERICAL LENS FOR CONCENTRATING DIFFUSE OPTICAL RADIATION

David E. Silverglate, Santa Cruz, Calif., assignor to Plantronics, Inc., Santa Cruz, Calif.

Filed Jul. 1, 1980, Ser. No. 165,070
Int. Cl.³ G02B *13/14*
U.S. Cl. 350—1.4 **4 Claims**



1. A lens for concentrating diffuse light which comprises:

a body of light transparent material, said body having -

(a) a planar back surface; and

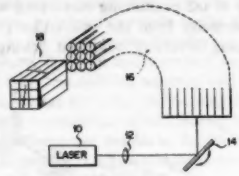
(b) a front surface projecting from the plane of the back surface, for refracting diffuse light impinging thereon toward the planar back surface, said front surface projecting a predetermined height above the planar back surface;

(c) the front surface being configured as a frustum of a right circular cone over an aft portion, and being configured as a spherical sector over a nose portion, said nose portion being of a height that is approximately 10% of the predetermined height of the front surface.

4,534,615
SCANNING TYPE LASER SYSTEM

Kenji Iwasaki, Utsunomiya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 18, 1983, Ser. No. 553,056
Claims priority, application Japan, Nov. 22, 1982, 57-203595
Int. Cl.³ G02B 27/08, 27/17
U.S. Cl. 350—6.1 15 Claims

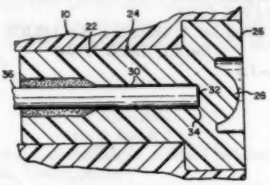


1. A scanning type laser system comprising:
laser oscillating means;
a kaleidoscope bundle formed of a plurality of kaleidoscopes for transmitting a laser beam emitted from said laser oscillating means; and
scanning means for scanning a laser beam emitted from said laser oscillating means to apply the laser beam to the respective kaleidoscopes successively.

4,534,616
FIBER OPTIC CONNECTOR HAVING LENS

Terry P. Bowen, Etters; Bernard G. Caron, both of Harrisburg, Pa.; Ronald F. Cooper, Littleton, Mass., and Douglas W. Glover, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 24, 1982, Ser. No. 381,480
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 25 Claims

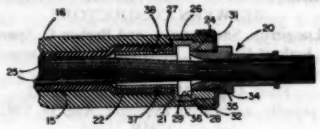


17. A fiber optic connector for terminating a fiber optic transmission means, comprising a ferrule means of resilient plastic material having forward section means and rear section means, said rear section means having profiled bore means extending axially therealong, along which a fiber optic transmission means is to extend, said bore means having a first bore section means larger in diameter than the diameter of said fiber optic transmission means, said forward section means having a stepped bore means extending axially and partially therethrough ending in an inner surface at which the end of said fiber optic transmission means is located when positioned within said stepped bore means, said forward section means including a lens means, with said inner surface of said stepped bore means being located at the focal point of said lens means, and said lens means has an aspherical lens section surrounded by an annular section.

4,534,617
FIBEROPTIC CABLE ASSEMBLIES

Jacobus Kloots, Sturbridge, and John Marengo, Cherry Valley, both of Mass., assignors to Luxtec Corporation, Sturbridge, Mass.

Filed Jun. 23, 1983, Ser. No. 507,062
Int. Cl.³ G02B 7/26
U.S. Cl. 350—96.20 3 Claims

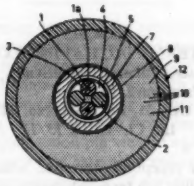


1. In a fiberoptic cable assembly having a length of multiple optical fibers, a flexible sheath enclosing said fibers and a connector at each end, the combination in at least one said connector comprising:
a. a rigid cylindrical coupling element having a sleeve portion enclosing terminations of said multiple optical fibers and being itself enclosed by a termination of said sheath, and an enlarged hollow portion having an enlarged annular ridge portion on its exterior surface adjacent said sleeve portion for securing a strain reliever;
b. a flexible resilient strain-relieving sleeve extending over said termination of said sheath and over said enlarged hollow portion; and,
c. a cup washer secured to said hollow portion with its cupped face extending over said strain-relieving sleeve compressing it against said annular ridge portion, and said connector further comprising an annular recess about said sleeve portion and a constricting element about said sheath opposite said annular recess forcing said sheath into said recess, and still further comprising an inner molded annular recess in said strain-relieving sleeve mating with said enlarged annular ridge so as to lock said strain-relieving sleeve securely to said coupling element under the compressive force of said cup washer.

4,534,618
OPTICAL COMMUNICATION CABLE

Siegfried Brüggendieck, Radevormwald, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1982, Ser. No. 435,024
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214778
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.23 12 Claims



1. An optical communication cable consisting of a cable core having optical fibers and sheath of synthetic resin surrounding said optical fibers and having glass fiber elements taking up tensile forces, the improvement therein comprising a binder of synthetic resin, said binder forming and holding said glass fiber elements in at least one uniform strand, said fibers being distributed in said resin, said fiber elements constituting at least 10% by volume of said cable sheath and at least 70% by volume of said at least one uniform strand.

4,534,619
REFLECTIVE SAFETY BELT

Richard T. Bedford, Rte. 2, Box 454J2, Tampa, Fla. 33610

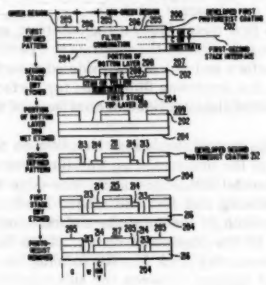
Filed Apr. 25, 1984, Ser. No. 603,628
Int. Cl.[3] G02B 5/12
U.S. Cl. 350—98 7 Claims

1. A reflective safety belt configured to be worn on a person-/user consisting of a pair of continuous loops intersecting each other on the back of the wearer and overlapping each other on the chest of the wearer such that the continuous intersecting-/overlapping loops cooperatively form a pair of side openings to receive the wearer's arms and an upper opening to receive the wearer's head.

4,534,620
STANDARDIZED MULTI-STACK DIELECTRIC-LAYER FILTER BLANK AND METHOD FOR FABRICATING COLOR-ENCODING FILTER THEREFROM

Michael T. Gale, Wettswil, and Hans W. Lehmann, Hedingen, both of Switzerland, assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 31, 1983, Ser. No. 512,541
Int. Cl.[3] G02B 5/28
U.S. Cl. 350—166 19 Claims



1. A standardized green-manifesting dielectric filter blank having a given surface area for use in fabricating therefrom a color-encoding transmissive filter that exhibits any arbitrary given spatial pattern over said given surface area, which spatial pattern comprises at least one spatial region manifesting green, at least one spatial region manifesting only a preselected certain one of cyan or yellow, and at least one spatial region manifesting white; said blank comprising:

a transparent substrate having a surface of at least said given area;

a first dielectric filter in contact with and substantially entirely covering all of said given surface area of said substrate, said first dielectric filter comprising a first stack of a plurality of dielectric layers having respective specified thicknesses and exhibiting respective indices-of-refraction such that only said preselected certain one of cyan-manifesting light or yellow-manifesting light is transmitted through said first stack, the top layer of said first stack being comprised of a first dielectric material which is inert to a given wet etchant;

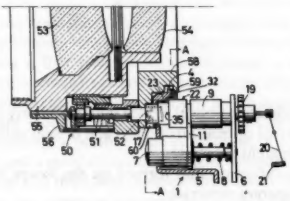
a second dielectric filter in contact with and substantially entirely covering all of said top layer of said first stack, said second dielectric filter comprising a second stack of a plurality of dielectric layers having respective specified thicknesses and exhibiting respective indices-of-refraction such that only the other one of said preselected certain one of cyan-manifesting light and yellow-manifesting light is transmitted through said second stack, the bottom layer of said second stack (1) being in contact with said top layer of said first stack and (2) being composed of a second dielectric material which is etchable by said given wet etchant, and;

wherein all of said layers of both said first and second stacks are etchable by a given dry etching process.

4,534,621
MOUNTING AND DEMOUNTING DEVICE OF OPTICAL UNIT

Yukio Miki, and Takeshi Egawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1982, Ser. No. 379,719
Claims priority, application Japan, May 21, 1981, 56-77518
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.
Int. Cl.[3] G02B 7/02
U.S. Cl. 350—257 5 Claims



1. A mounting and demounting device capable of mounting and demounting an interchangeable optical instrument on and from an optical main instrument by rotation of the former relative to the latter, said device comprising

a first mount member of one of said interchangeable optical instrument and said optical main instrument, said first mount member being formed with a first mount face and a throughhole having an opening on said first mount face;

a second mount member of the other of said interchangeable optical instrument and said optical main instrument, said second mount member being formed with a second mount face to be brought into contact with said first mount face with said interchangeable optical instrument mounted on said optical main instrument and also formed with a positioning recess located on said second mount face;

a positioning member disposed in said throughhole of said first mount member and movable between a projecting position where said positioning member projects largely beyond said first mount face and a retracted position where said positioning member retracts behind or projects a little behind said first mount face, said positioning member being engageable in said positioning recess when moved to the projecting position;

a first urging means for urging said positioning member to the projecting position;

a locking means capable of locking said positioning member in the retracted position against the action of said first urging means, and

a detection means for detecting the state of the mounting and

demounting of said interchangeable optical instrument on and from said optical main instrument to automatically release the locking of said positioning member by said locking means immediately prior to completion of the mounting until immediately after start of the demounting.

4,534,622

SOLID-STATE DEVICE HAVING A PLURALITY OF OPTICAL FUNCTIONS

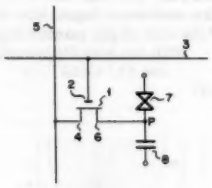
Nozomu Harada; Yasuhisa Oana, both of Yokohama; Keisuke Ogi, Tokyo; Koji Izawa, Yokohama; Akira Taya, Kawasaki, and Masanori Sakamoto, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 3, 1984, Ser. No. 567,558

Claims priority, application Japan, Feb. 28, 1983, 58-32430

Int. Cl.³ G02F 1/13

U.S. Cl. 350—334 **10 Claims**



1. A solid-state optical device with a plurality of cells having a plurality of optical functions, each of said cells comprising:

a transparent substrate;

an anti-reflection film formed on the lower surface of said transparent substrate;

a MOS transistor formed on the upper surface of said transparent substrate and including a source-drain path having one end connected to a data line, a channel region, a gate insulating film and a gate electrode connected to an address line;

a capacitor formed on the upper surface of said transparent substrate and having a first and second electrode, said first electrode being transparent and formed on the upper surface of said transparent substrate, a photoconductive film being formed such that it intervenes between said first and second electrodes, a light signal transmitted through said transparent substrate being transmitted through said first electrode to be incident on said photoconductive film, said second electrode being connected to the other end of the source-drain path of said MOS transistor;

a transparent insulating layer formed on the upper surface of said MOS transistor and capacitor;

a non-transparent conductive layer formed on said transparent insulating layer and connected to the other end of the source-drain path of said MOS transistor;

a display cell formed on said non-transparent conductive layer, said display cell including a display material layer formed on said non-transparent conductive layer and a transparent conductive layer formed on said display material layer, the light transmittance of said display material layer being variable according to a voltage applied between said non-transparent conductive layer and transparent conductive layer; and

light transmitting means for leading light incident on said display cell to said transparent substrate.

4,534,623

HORIZONTALLY-STACKED METAL-INSULATOR-METAL ELEMENT FOR ELECTRO-OPTICAL DEVICE AND METHOD FOR MANUFACTURE

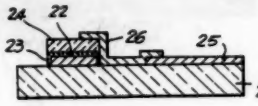
Ryosuke Araki, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,416

Claims priority, application Japan, Jan. 18, 1983, 58-6502

Int. Cl.³ G02F 1/13

U.S. Cl. 350—339 R **16 Claims**



1. A metal-insulator-metal device formed on a substrate, comprising:

a substrate;

a first metal film selectively patterned on the substrate and having a top surface and at least two side-edge surfaces;

a first insulating film formed on the top surface and at least a portion of the two side-edge surfaces of the first metal film;

a second insulating thick film formed on the top planar surface of the first insulating thin film; and

a metal conductor formed on a portion of one side-edge surface of the second insulating thick film and on one side-edge of the first insulating thin film and a portion of the substrate for forming a non-linear metal-insulator-metal element between the side-edge surface of the first metal film and the metal conductor and whereby the metal conductor may be electrically coupled to a liquid crystal driving electrode.

15. A process for preparing a metal-insulator-metal device on a substrate, comprising:

providing a transparent substrate;

forming a first metal film on the substrate and selectively patterning the film on the substrate to a pattern and having a top surface and at least two side-edge surfaces;

forming a first insulating film on the top surface and at least a portion of the two side-edge surfaces of the first metal film;

depositing a second insulating thick film on the top planar surface of the first insulating thin film; and

forming a metal conductor on the side-edge surface of the first insulating thin film and second insulating thick film and a portion of the substrate and reducing the overlap portion of the conductor on the planar surface of the second insulating thick film for forming the metal-insulator-metal element between the side-edge surface of the first metal film and the metal conductor.

4,534,624

CONSTRUCTION OF LENS BARREL OPERATED BY ELECTROMAGNETIC INDUCTION

Katuhiko Toda, and Susumu Sugiura, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,030

Claims priority, application Japan, Jul. 14, 1981, 56-109588; Jul. 22, 1981, 56-114856

Int. Cl.³ G02B 7/02

U.S. Cl. 350—429 **6 Claims**

1. A lens barrel operated by electromagnetic induction, comprising:

(a) lens barrel means for attachment to the body of an apparatus;

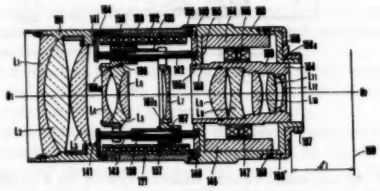
(b) first and second optical element holders arranged to hold an optical variator element which performs a focal length

adjusting action and an optical compensator element, said holders being arranged to be slidable directly or indirectly relative to said lens barrel means and to keep an optical center unvaried during the sliding movement thereof; and

(c) means for moving said first and second optical element holders along the optical axis of said optical elements with said holder kept in a non-rotating state,

said moving means being electromagnetic induction means including a stator element and a movable element and being of the type capable of moving said movable element in a non-rotating state, said moving means being arranged to move each of said holders independently of the other in response to an electrical signal,

said stator having a magnet part including exciting coils and a plurality of poles which are made of a ferromagnetic



material and formed at two pole parts of a permanent magnet, which are arranged on the inner circumference of said lens barrel means along the optical axis, said magnet part being arranged in a row over the whole moving range of said optical variator and compensator elements,

said movable element being formed from a ferromagnetic material on said first and second optical element holders and being provided with several pole teeth arranged in a row along the optical axis and spaced at a pitch differing from that of said poles of the stator, said movable element being arranged to cause the first and second optical element holders to be moved independently of each other by attraction which takes place between said poles of the stator and said pole teeth of the movable element when power supply is effected to said exciting coils.

4,534,625

LENS TUBE FOR A HIGH VARI-FOCAL RATIO ZOOM LENS

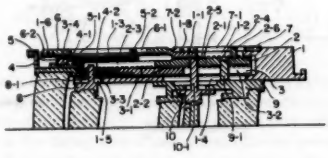
Mitsuo Ohnuki, Sagamihara, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 291,104, Aug. 7, 1981, abandoned. This application Mar. 8, 1984, Ser. No. 586,652

Claims priority, application Japan, Aug. 19, 1980, 55-112952; Aug. 19, 1980, 55-112953; Aug. 19, 1980, 55-112954

Int. Cl.³ G02B 7/10, 15/14

U.S. Cl. 350—429 **3 Claims**



1. A high vari-focal ratio zoom lens comprising a lens tube, a focusing ring and a zooming ring coaxially supported by said lens tube, a plurality of lens groups positioned within said tube, first control means mounted within said tube interconnecting said focusing ring with two lens groups for moving the same together for the purpose of focusing, and second control means mounted within said tube interconnecting said zooming ring with said two lens groups for moving the same in opposite directions for the purpose of zooming, in which said zoom lens incudes third, fourth and fifth lens groups, and means within said tube interconnecting said zooming ring with said five lens groups for performing at least four independent movements for the purpose of zooming.

4,534,626

LARGE RELATIVE APERTURE TELEPHOTO LENS SYSTEM

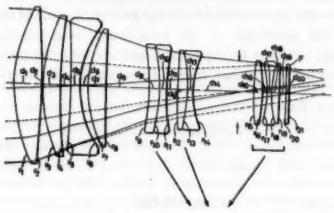
Shin-ichi Mihara, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 524,082

Claims priority, application Japan, Aug. 24, 1982, 57-145490

Int. Cl.³ G02B 9/64, 13/02

U.S. Cl. 350—454 **11 Claims**



1. A large relative aperture ratio telephoto lens system comprising a first converging lens group, a diverging lens group and a second converging lens group, said first converging lens group comprising a first positive lens component, a second positive lens component, a negative lens component and a third positive lens component, said diverging lens group comprising two negative lens components, and said second converging lens group comprising a positive lens component, a negative lens component and a positive lens component; wherein at least one of the second and third lens components constituting said first converging lens group is arranged that Abbe's number is larger than 80 and partial dispersion ratio is larger than 0.53, and said first positive lens component and said negative lens component constituting said first converging lens group satisfying the following conditions (1) and (2):

$$\nu_1 > 80,\ \theta_1 > 0.53 \quad (1)$$

$$\nu_3 < 45,\ \theta_3 < 0.575 \quad (2)$$

wherein the reference symbols ν_1 and θ_1 represent Abbe's number and partial dispersion ratio of the first positive lens component arranged in said first converging lens group, and the reference symbols ν_3 and θ_3 designate Abbe's number and partial despersion ratio of the negative lens component arranged in said first converging lens group.

4,534,627

SUNGLASSES PIVOTALLY MOUNTED ON BROWBAR OF SPECTACLE FRAME

George W. Vosper, 149 Earl St., Kingston, Ontario, Canada K7L 2H3

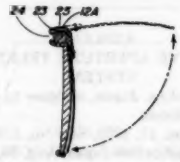
Filed Jul. 26, 1982, Ser. No. 402,049

Int. Cl.³ G02C 7/08

U.S. Cl. 351—47 **3 Claims**

1. The combination of spectacles having lenses and sunglasses attached to said spectacles, said spectacles having a browbar non-circular in outline cross-sectional shape and said sunglasses being pivotally and detachably connected to said browbar, said sunglasses comprising a pair of light-weight, colored, transparent plates, a bridge plate and means securing

the transparent plates to the bridge plate; said bridge plate having a generally C-shaped clip formed integrally therewith detachably and pivotally mounting the sunglasses on the browbar of the spectacles, said clip having an inner surface corresponding essentially in outline configuration to the cross-sec-



tional shape of the browbar and together cooperating to restrain pivotal movement of the sunglasses at each of two different pivotal positions of the sunglasses, one position being where the sunglass transparent plates overlie the lenses of the spectacles and the other where they project forwardly.

4,534,628

HINGE FOR MOUNTING SPECTACLES

Michel Morel, Morbier, France, assignor to Paget et Morel, Morex, France

Filed Nov. 12, 1982, Ser. No. 440,757
Claims priority, application France, Nov. 20, 1981, 81 21926
Int. Cl.³ G02C 5/22, 5/14
U.S. Cl. 351—153 **13 Claims**

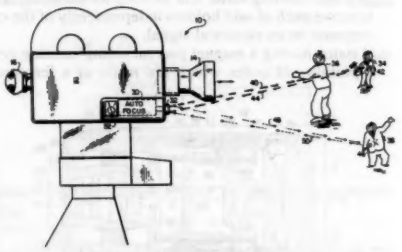
1. In an improved hinge for mounting a side of a spectacle frame which allows said side to open beyond its normal open position and also allows its elastic return into said normal open position, with said hinge having a mounting knuckle attached to that part of said spectacle frame supporting the lenses and a co-operating side knuckle supported by said side; said improvement comprising an elastic return mechanism positioned concentrically in said side comprising an envelope enclosing said side from its end and abutting against an elastic return means positioned inside an external casing which is capable of sliding on said envelope, said external casing further abutting against said mounting knuckle in said normal open position and, when opened beyond said normal open position, said external casing being capable of moving back by sliding on said envelope so as to cause compression of said elastic return means; and thereby retaining substantially the same side thickness as a comparably sized spectacle.

4,534,629

MOTION PICTURE CAMERA AUTOMATIC FOCUSING SYSTEM

Robert W. Bogle, 991 Skylark Dr., La Jolla, Calif. 92037, and Gary Gero, 25191 Rivendell Dr., El Toro, Calif. 92630

Filed Jul. 5, 1983, Ser. No. 510,686
Int. Cl.³ G03B 3/00
U.S. Cl. 352—140 **20 Claims**



1. An automatic camera focusing system for a camera, said system comprising:

an adjustable focus lens system having focusing means for adjusting the focus of said lens;

first radio signal generating means carried by a camera to be focused for generating a first radio signal;

second radio signal generating means carried by a photographic subject and responsive to said first radio signal for generating a second radio signal;

means responsive to the time interval between transmittal of said first signal and receipt of said second signals for generating a focusing signal; and

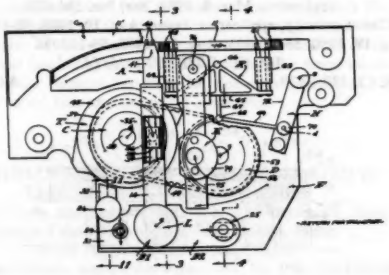
said focusing means responsive to said focusing signal for focusing said camera lens at a distance representative of said focusing signal.

4,534,630

WIDE FILM TRANSPORT AND REGISTER MOVEMENT

Geoffry H. Williamson, Los Angeles, Calif., assignor to Imax Systems Corporation, Toronto, Canada

Filed Jan. 31, 1984, Ser. No. 575,446
Int. Cl.³ G03B 1/22
U.S. Cl. 352—194 **24 Claims**



1. A film transport and register movement for wide format film cameras and projectors, and including:

a base with an upstanding register plate normal thereto and having a planar aperture section and a tangentially continuing arcuate transport section concentric about a first axis spaced rearward therefrom and normal to the base, there being an aperture plate overlying and complementary to the register plate and spaced therefrom forming a

film guideway for film having opposite perforated margins,

a pair of spaced transport arms pivoted on said first axis and each aligned with a perforated margin of the film and carrying at least one retractile claw pin for penetration of the film,

a transmission means between the transport arms and on a second axis parallel to and intermediate the register plate and said first axis and comprising, a crank shaft rotatable on said second axis and having eccentric coaxial crank pins and each engageable with one of the spaced transport arms for oscillatory movement of said pair thereof, a pair of spaced cams and each closely adjacent to one of said pair of transport arms and each shaped to project the at least one claw pin for film penetration and transport during a first oscillatory movement of the transport arms and to permit retraction thereof during a second oscillatory movement thereof,

a drive means on a third axis laterally offset from the second axis and coupled to the transmission means between the transport arms to oscillate the same,

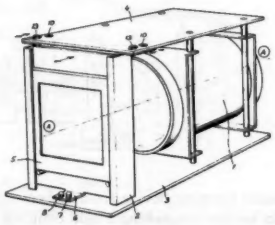
and register means comprising, at least one register pin for penetration of the film, and a cam driven by the drive means and shaped to project the register pin for film penetration and registration during said second oscillatory movement of the transport arm following said preceeding first transport oscillatory movement of the transport arm and transport of the film thereby.

4,534,631

SLIDE GUIDE ADJUSTING DEVICE AT SLIDE PROJECTOR

Kennert E. G. Hillström, Mölnlycke, and Rolf G. Fransson, Angered, both of Sweden, assignors to Victor Hasselblad Aktiebolag, Gothenburg, Sweden

Filed Aug. 5, 1983, Ser. No. 520,539
Claims priority, application Sweden, Aug. 9, 1982, 8204621
Int. Cl.³ G03B 1/50
U.S. Cl. 353—95 **4 Claims**



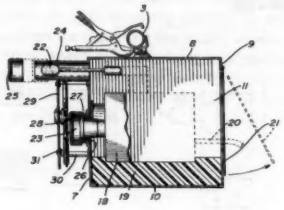
1. A device for use with a slide projector having a slide guide for adjusting the slide guide in a plane perpendicular to the optical axis of the projector, characterized in that said device comprises a first fixing means to connect a limited portion of a first side of the slide guide to a first stationary portion of the projector, a second fixing means located at a portion of a side of the slide guide opposed to said first side to connect the guide to a second stationary portion of the projector, and third fixing means located at another portion of said opposed side of the slide guide to connect the guide to a third stationary portion of the projector, said second and third fixing means being capable of adjusting and fixing the orientation of said slide guide in the direction of the optical axis independently of one another.

4,534,632

CAMERA-PROTECTING APPARATUS INCLUDING A FAN FOR DEFLECTING PARTICLES

André Laviolette, 1013 de la Ronde St., Quebec, Canada (G1J 4B5)

Filed Apr. 10, 1984, Ser. No. 598,576
Int. Cl.³ G03B 29/00, 17/02
U.S. Cl. 354—81 **8 Claims**



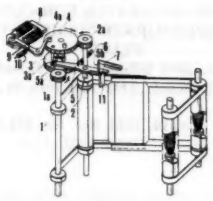
1. A camera-protecting apparatus comprising a box adapted to receive a camera therein and having a front wall, said front wall having an opening through which the objective of the camera may extend, a fan mounted on said front wall for rotation in a plane parallel to and forwardly spaced from said front wall and about an axis which is eccentric to said front wall opening, motor means located in said box for driving said fan in rotation, said fan having a hub completely out of register with said front wall opening and having radial blades movable across said front wall opening, so as to deflect away from the camera objective any dirt or the like particles thrown towards the same.

4,534,633

DELAY MECHANISM FOR SINGLE REFLEX CAMERA

Tsunemasa Ohara, Tokyo; Masayuki Suzuki, and Masayoshi Yamamichi, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1982, Ser. No. 452,126
Claims priority, application Japan, Dec. 25, 1981, 56-214061
Int. Cl.³ G03B 9/64, 9/32
U.S. Cl. 354—237 **2 Claims**



1. A release device for releasing a shutter leading curtain in a single lens reflex camera, comprising:

a holding member for holding the shutter leading curtain,

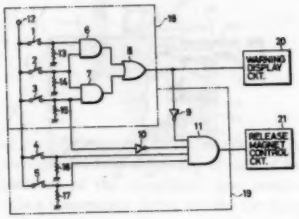
a release member for releasing the holding of the holding member, and

a speed reducing mechanism for reducing the operational speed of said release member, said speed reducing mechanism having an anchor and an escape wheel provided with a notched portion, and imparting a speed reducing effect to said release member through the swinging action of said anchor by said engage wheel when said release member is in an operational range where said release member does not effect the release operation, and imparting no speed reducing effect to said release member by keeping said anchor positioned in the notched portion of the escape wheel when said release member is in an operational range where said release member effects the release operation.

4,534,634
ERRONEOUS RELEASE PREVENTING DEVICE FOR CAMERA

Yasushi Tabata; Kimiaki Ogawa, and Toshimitsu Takahashi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,407
Claims priority, application Japan, Jan. 17, 1983, 58-4471[U]
Int. Cl.³ G03B *17/38*
U.S. Cl. 354—268 **4 Claims**

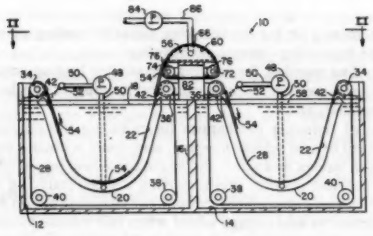


1. In an electronic release type camera having an automatic aperture control function, a bulb function and a self-timer function, an erroneous release preventing device comprising:
an automatic aperture controlling switch which is turned on when an automatic aperture control photographing mode is selected;
a bulb photographing switch which is turned on when a bulb photographing mode is selected;
an erroneous operation detecting circuit for detecting a state of at least one of said bulb photographing switch and said automatic aperture controlling switch being turned on simultaneously and said bulb photographing switch and said self-timer switch being turned on simultaneously and providing a warning signal accordingly; and
a magnet control circuit for controlling energization of an electromagnet effecting release of a shutter of said camera, said release magnet control circuit comprising means for inhibiting energization of said electromagnet in response to said warning signal.

4,534,635
METHOD AND APPARATUS FOR CONVEYING A FLEXIBLE, IMPERFORATE MEMBER THROUGH A FLUID

Gary M. Johnston, 2444 Hihiwai 1001, Honolulu, Hi. 96826, and Leonard A. Ciupak, 1133 Makaiwa St., Honolulu, Hi. 96816

Filed Nov. 14, 1983, Ser. No. 551,124
Int. Cl.³ G03D *3/02, 3/12*
U.S. Cl. 354—322 **8 Claims**

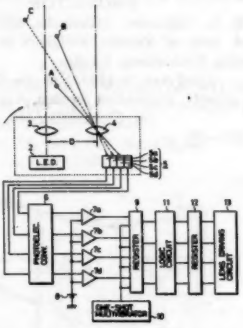


1. Apparatus for conveying a photographic material through a liquid in photographic processing comprising,
a container having a liquid therein,
a support member having a generally U-shaped configuration positioned in said liquid in said container, said support member having a surface with a pervious portion and said pervious portion of said surface of said support member including a plurality of elongated, longitudinally extending slots,
a flexible carrier member positioned in overlying relation with said support member surface, said flexible carrier member having a pervious portion,
conveying means for conveying said flexible carrier member in said liquid in abutting relation with said surface of said support member with said carrier pervious portion in overlying relation with said support member pervious portion,
suction means for applying a suction through said pervious portion in said support member surface and through said pervious portion in said flexible carrier member in overlying relation therewith, and
said flexible carrier member arranged to engage a surface of a flexible, impervious photographic material by said suction through said pervious portion of said flexible carrier member, and thereby convey said flexible, impervious photographic material with said flexible carrier member on said surface of said support member.

4,534,636
AUTOMATIC FOCUSING DEVICE FOR CAMERA

Saburo Sugawara, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1984, Ser. No. 571,774
Claims priority, application Japan, Jan. 18, 1983, 58-5333
Int. Cl.³ G03B *3/00*
U.S. Cl. 354—403 **7 Claims**



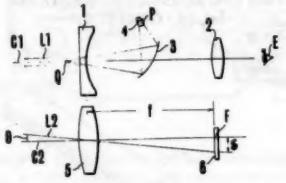
1. An automatic focusing device for a camera, comprising:
a range finder section comprising a light emitting section for applying light to objects to be photographed at predetermined spaced positions within a photographing field and a linear array of light detecting elements for producing output distance signals representing distances of said objects to an image pickup surface;
means for directing light reflected from said objects onto corresponding ones of said light detecting elements;
logic and memory means for detecting and storing among said distance signals only a distance signal corresponding to an object at a shortest distance among said objects; and
a lens driving section, operating in response to said signal stored in said memory section, for positioning a photographing lens to a focusing position for said object at the shortest distance.

4,534,637

CAMERA WITH ACTIVE OPTICAL RANGE FINDER

Takashi Suzuki; Susumu Matsumura, and Keiji Ohtaka, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 446,954, Dec. 6, 1982, abandoned. This application Oct. 2, 1984, Ser. No. 656,430
Claims priority, application Japan, Dec. 12, 1981, 56-200325
Int. Cl.[3] G03B *3/00*
U.S. Cl. 354—403 12 Claims



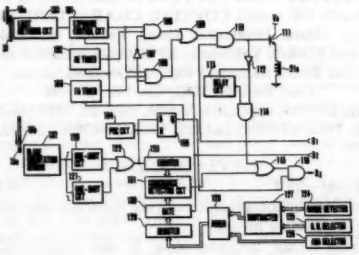
1. A camera comprising:
(a) light emitting means for emitting light;
(b) finder means for observing an image of an object; said finder means having an objective optical system;
(c) optical means for projecting light produced from said light emitting means toward the object through said objective optical system of said finder means, said optical means being formed so that rays of light emerging from said objective optical system are substantially collimated; and
(d) light receiving means for producing a signal for determining the relationship between the object and the camera by detecting the light from the objective system after reflection from the object.

4,534,638

EXPOSURE CONTROL DEVICE FOR CAMERA

Michio Hirohata, and Hideo Ikari, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 414,634, Sep. 3, 1982, abandoned. This application Aug. 1, 1984, Ser. No. 636,789
Claims priority, application Japan, Sep. 12, 1981, 56-144268
Int. Cl.[3] G03B *7/08, 7/93, 9/14*
U.S. Cl. 354—418 4 Claims



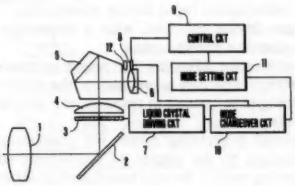
1. An exposure control device for a camera comprising:
blade members forming a photographic main aperture and an auxiliary aperture for measuring light from an object to be photographed, said auxiliary aperture being arranged to be opened and closed with the main aperture, the auxiliary aperture being arranged so that when blade members move to open the auxiliary aperture changes from a pre-open state to a totally closed state, and then opens again in response to opening of the aforesaid main aperture;
a light receiving element for measuring light, from an object to be photographed, through said auxiliary aperture;
exposure control means for counting light metering information from said light receiving element and upon attainment of a count to a prescribed value to initiate a closing operation of said blade members; and
detecting means having a light projection element and a light receiving element and responsive to opening and closing of an optical path between said light projection element and said light receiving element by action of said blade members for detecting the totally closed position of the auxiliary aperture, said detecting means being arranged to cause said exposure control means to start counting when said auxiliary aperture is totally closed from the pre-open state.

4,534,639

CAMERA HAVING AN EXPOSURE MODE CHANGE-OVER DEVICE

Yuichiro Konishi, Tokyo; Tokuichi Tsunekawa, and Hiromi Someya, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,641
Claims priority, application Japan, Dec. 21, 1982, 57-224381; Dec. 21, 1982, 57-224382
Int. Cl.[3] G03B *7/099, 17/20*
U.S. Cl. 354—432 5 Claims



1. A single lens reflex camera having an exposure mode change-over device which can select one exposure mode out of a variety of exposure modes, comprising:
a photo-taking lens;
a focus plate on which object light beam from the photo-taking lens is imaged, said focus plate being formed by an electrical optical element divided into a plurality of sections;
a light receiving element to measure the object light beam from a transmitting part of said focus plate;
a plurality of switches corresponding to said various exposure modes; and
a circuit to control density of each section of said electrical optical element depending on the switching action of the plurality of switches, said circuit controlling the density of each section of said electrical optical element so as to select a light measuring mode corresponding to a set exposure mode.

4,534,640

EXPOSURE CONTROL SYSTEM FOR A CAMERA HAVING A DIGITAL COMPUTER

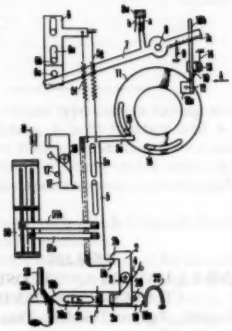
Tadashi Ito; Yasuo Isobe; Fumio Ito, all of Kanagawa, and Soichi Nakamoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 608,914, May 10, 1984, abandoned, which is a continuation of Ser. No. 398,807, Jul. 16, 1982, abandoned, which is a continuation of Ser. No. 027,776, Apr. 6, 1979, abandoned, which is a continuation of Ser. No. 882,182, Feb. 28, 1978, abandoned, which is a continuation of Ser. No. 696,440, Jun. 15, 1976, abandoned, which is a continuation of Ser. No. 519,629, Oct. 31, 1974, abandoned. This application Oct. 24, 1984, Ser. No. 664,924

Claims priority, application Japan, Nov. 1, 1973, 48-123010; Dec. 10, 1973, 48-139760; Dec. 25, 1973, 49-1216

Int. Cl.[3] G03B *7/085, 17/00*

U.S. Cl. 354—448 7 Claims



1. An aperture information input device for a camera which compares a computed aperture value signal obtained through exposure computation with a preset aperture signal representing a preset aperture value to be adjusted and which determines the aperture of a photograph taking lens when the difference between the two signals reaches a predetermined value, the aperture information input device comprising:

a diaphragm device provided with a diaphragm and diaphragm aperture preset means;

adjusting means for adjusting the preset aperture value of the diaphragm aperture preset means, the adjusting means being arranged to operate in response to a release action of the camera;

aperture signal generating means for generating a signal corresponding to the degree of adjustment effected by said adjusting means, the aperture signal generating means including:

(a) a magnetic reluctance element;

(b) a magnet measuring in length about one half of the length of said magnetic reluctance element, the magnet being interlocked with said adjusting means to move on the magnetic reluctance element in response to the operation of the adjusting means;

(c) input terminals provided at both ends of said magnetic reluctance element for receiving a voltage input applied thereto; and

(d) output terminals provided in the middle part and one end of said magnetic reluctance element for producing a voltage output as an aperture signal, the voltage output becoming the lowest when said magnet is at an initial position on said magnetic reluctance element and then increasing accordingly as the magnet moves toward an end position on the magnetic reluctance element; and

lock means for stopping the operation of said adjusting means, the lock means being arranged to operate when the difference between the aperture signal produced from said output terminal and the computed aperture value signal obtained through exposure computation reaches the predetermined value after comparison of the two signals.

4,534,641

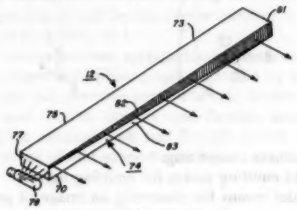
CHARGE ERASE DEVICE FOR COPYING OR REPRODUCTION MACHINES AND PRINTERS

W. Keith Gilliland, Webster; Lawrence M. Hart, Ontario, and Charles Nesta, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1983, Ser. No. 547,200

Int. Cl.[3] G03G *15/00*

U.S. Cl. 355—3 R 7 Claims



1. An erasing device for dissipating photoreceptor charges in a xerographic type reproduction machine having a photoreceptor, comprising:

(a) an elongated light transmitting fiber opposite said photoreceptor surface at substantially right angles to the path of movement of said photoreceptor, the axial length of said fiber being at least equal to the width of said photoreceptor surface;

(b) a light source at at least one end of said fiber, said fiber transmitting light from said light source axially along the interior thereof toward the opposite end of said fiber; and

(c) light control means for progressively increasing the light discharge area of the section of said fiber facing said photoreceptor in proportion to the distance along the fiber from said light source to thereby offset the loss of light intensity as said light is being transmitted through the interior of said fiber.

4,534,642

ELECTROPHOTOGRAPHIC COPYING APPARATUS FOR EFFECTING A COPYING OPERATION ON THE BASIS OF A SET COPYING CHARACTERISTIC

Kunihiko Miura, Hiratsuka; Shouji Takano, Kawasaki, and Masashi Kimura, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 21, 1982, Ser. No. 451,798

Claims priority, application Japan, Dec. 25, 1981, 56-215570; Jan. 22, 1982, 57-8708; Jan. 22, 1982, 57-8709; Jan. 28, 1982, 57-12305

Int. Cl.[3] G03G *15/04*

U.S. Cl. 355—14 E 8 Claims

1. An electrophotographic copying apparatus comprising:

photoconductive means;

charging means disposed close to said photoconductive means for electrically charging said photoconductive means;

exposure means for exposing said photoconductive means to form a latent image on said photoconducitve means, said image corresponding to the pattern of a document;

developer means disposed close to said photoconductive means for developing the latent image, thus forming a developed image, using one-component developer;

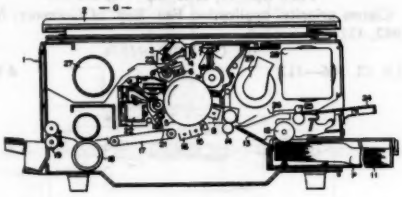
means for applying a bias voltage on said developer means;

transfer means disposed close to said photoconductive

means for transferring the developed image to a paper sheet;

means for selecting whether a document should be copied with contrast or gradation; and

γ characteristic setting means for setting γ characteristic (i.e. document density-copy density characteristic) corresponding to the selection by said selecting means and varying at least one of the bias voltage of said bias applying means and the exposure amount of said exposure means in accordance to the set γ characteristic, thereby achieving a developing process suitable process suitable to the quality of the document being occupied.



4,534,643

IMAGE FORMING APPARATUS

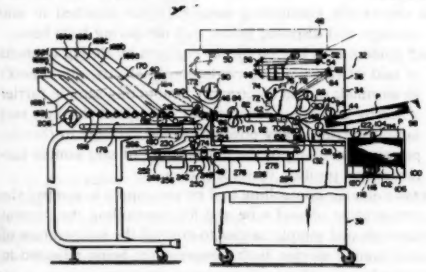
Junji Watanabe, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 14, 1983, Ser. No. 458,026

Claims priority, application Japan, Jan. 29, 1982, 57-12838; Jan. 29, 1982, 57-12849

Int. Cl.³ G03G *15/00*; B65H *29/60*

U.S. Cl. 355—3 SH **21 Claims**



10. An image forming apparatus of the type including means defining a copy path having feed and discharge ends, feed and conveying means for sequentially feeding paper sheets into said copy path at said feed end and for sequentially conveying said paper sheets along said copy path, discharge means for discharging said paper sheets from said copy path at said discharge end, image transfer means disposed between said feed and discharge ends of said copy path for transferring an image of a master document onto one side of at least one of said paper sheets as said one paper sheet is conveyed along said copy path, and sorter means operatively connected to said discharge means for sorting said paper sheets, the improvement wherein said sorter means comprises:

at least one sort storage chamber and a nonsort storage chamber;

means defining (a) a first guide path in communication with said nonsort storage chamber, (b) a second guide path in communication with said sort storage chamber, and (c) a common guide path in communication with said discharge end of said copy path and said first and second guide paths;

conveying direction switching means operatively associated with said common guide path and moveable between (i) a first switching position wherein communication is established between said common and said first guide paths so that a paper sheet discharged by said discharge means is guided into said nonsort storage chamber, and (ii) a second switching position wherein communication is established between said common and said second guide paths so that a paper sheet discharged by said discharge means is guided into said at least one sort storage chamber;

selecting means displaceable between sort and nonsort positions for selectively moving said conveying direction switching means between said first and second switching positions, respectively, said selecting means including cam means defining a cam surface engageable with said conveying direction switching means when said selecting means is displaced into said nonsort position to responsively translate displacement of said selecting means into movement of said conveying direction switching means from said second switching position to said first switching position whereby communication between said common and first guide paths is established; and

displacing means for displacing said selecting means between said sort and nonsort positions to respectively cause disengagement and engagement between said cam surface of said selecting means and said conveying direction switching means.

4,534,644

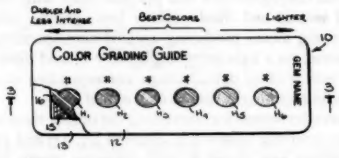
GUIDES FOR COLOR GRADING FACETED GEMSTONES

Casper R. Beesley, 210 Commonwealth Ave., Mt. Vernon, N.Y. 10552

Filed Mar. 22, 1983, Ser. No. 477,749

Int. Cl.³ G01J *3/52*; G01N *21/87*

U.S. Cl. 356—30 **11 Claims**



1. A set of guides for facilitating the color grading of faceted gemstones of different types, each guide being adapted to grade stones of a particular type under standardized conditions of illumination and comprising:

(A) a back panel having a front panel thereover provided with a longitudinal row of port holes;

(B) a reflective strip sandwiched between said panels and having in the zones under said holes an embossed pattern creating multiple reflections; and

(C) a planar optical filter interposed between each hole and its associated zone to interact with the light reflected thereby to simulate the visual impression of a standard grade of said stone of a particular type, the respective filters for the row of holes being such as to provide a range of standard color grades, whereby in making a color judgment, the observer seeks the closest match between the unknown under examination and one of the guide standards.

4,534,645

AUTOMATIC LENS METER

Masao Nohda, Yokosuka, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 389,055
Claims priority, application Japan, Jun. 26, 1981, 56-98405
Int. Cl.[3] G01B 9/00
U.S. Cl. 356—125 3 Claims

1. An automatic lens meter including:

(a) a first positive lens system;

(b) a second positive lens system whose optical axis is coincident with the optical axis of the first positive lens system, the second positive lens system having its forward focal plane coincident with the rearward focal plane of said first positive lens system;

(c) a pin-hole plate disposed in the forward focal plane of said second positive lens system, the optical axis of said first positive lens system and said second positive lens system passing through the pin-hole of said pin-hole plate;

(d) four spot light source means disposed on the side of the forward focal plane of said first positive lens system, said four spot light source means being provided equidistantly on a circumference centered at said optical axis, two of the light source means at opposite sides of the optical axis forming a first pair, the remaining two of the light source means forming a second pair, said four spot light source means being made conjugate with a predetermined position on the side of the rearward focal plane of said second positive lens system by said first and second positive lens systems, a lens to be examined being disposed at said predetermined position;

(e) a third positive lens system provided on the side opposite to said second positive lens system with respect to said predetermined position;

(f) light-receiving means disposed at a fixed position relative to and conjugate with said pin-hole plate with respect to said second and third positive lens systems, said light-receiving means producing a signal corresponding to the position, on a light-receiving surface of said light-receiving means of an optical image corresponding to each of said four spot light source means; and

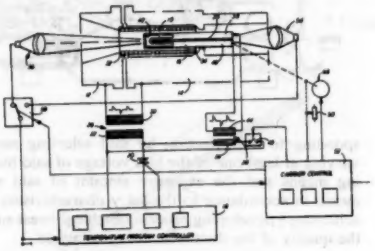
(g) converter means for converting the output signals of said light-receiving means into diopters D_1, D_2 and principal meridians axis degree θ, said converter means having a converting circuit for defining as an X-direction the direction connecting the images of said first pair of the light source means formed on the light-receiving means, and as a Y-direction the direction connecting the images of said second pair of the light source means formed on the light-receiving means, when a spherical lens as the lens to be examined is disposed at said predetermined position, said converting circuit, when an arbitrary lens to be examined is disposed at said predetermined position, producing signals corresponding to distances x_1 and y_2 over which the distance between the images of said first pair of the light source means formed on the light-receiving means and distances x_2, y_1 over which the distance between the images of said second pair of the light source means formed on the light-receiving means are projected in said X-direction and Y-direction, said converter means thereby determining said diopters D_1, D_2 and principal meridians axis degree θ based on said signals corresponding to distances x_1, y_2, y_1 and y_2.

4,534,646

DEVICE FOR ATOMIZING A SAMPLE IN FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY

Rolf G. A. Tamm, Salem, and Toma Tomoff, Uberlingen, both of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,989
Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217417
Int. Cl.[3] G01N 21/74
U.S. Cl. 356—312 6 Claims



1. Device for atomizing a sample in flameless atomic absorption spectroscopy, said device comprising:

a graphite tube held between a pair of annular electrodes;

a controllable power supply arranged to generate a current through said electrodes and through said graphite tube;

a carriage moveable in a longitudinal direction either into or out of said tube, said carriage being guided by guide means disposed so that a measuring light beam may pass through said tube;

an electrically conducting sample carrier attached to said carriage and disposed below said measuring light beam;

said guide means having busses engaged by sliding contacts of said carriage, which continuously electrically connect to terminals of said electrically conducting sample carrier whereby a heating current may be passed through said sample carrier in any position of said carriage to thereby permit controlling of the temperature of said sample carrier at any position thereof; and

a controller for controlling said power supply to control the temperature of said tube and for controlling the current through said sample carrier to control the temperature of said sample carrier, both temperatures being adjusted in accordance with a predetermined program.

4,534,647

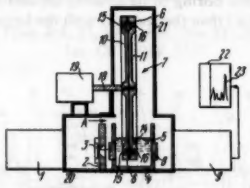
APPARATUS FOR PHOTOMETRICALLY SCANNING GELS

Valery N. Gross, and Vyacheslav D. Stupnik, both of Alma-Ata, U.S.S.R., assignors to Institut Molekulyarnoi Biologii Biokhimii Akademii Nauk Kazakhskoi SSR, Alma-Ata, U.S.S.R.

PCT No. PCT/SU81/00015, § 371 Date Oct. 18, 1982, § 102(e) Date Oct. 18, 1982, PCT Pub. No. WO82/02946, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 23, 1981, Ser. No. 438,868
Int. Cl.[3] C25B 9/00; G01J 1/04; G01N 21/03, 27/26
U.S. Cl. 356—344 5 Claims

1. An apparatus for photometrically scanning gels, comprising a monochromator from which a light beam pases through a stop aperture and a gel placed in a cell, which are installed one after the other along the path of the light beam, the cell being caused to move relative to the light beam by means of an electromechanical drive and the light being received by a photometer, wherein the improvement comprises the cell

comprising two superposed discs each having on at least one side thereof congruent grooves which define at least one compartment for placing gels therein when the discs are superposed on one another.

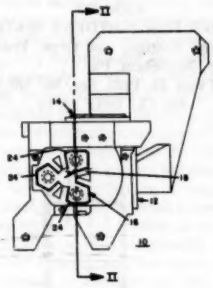


4,534,648

GYRO SENSOR BLOCK SUSPENSION

Arthur D. Cangialosi, Wayne, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 7, 1983, Ser. No. 549,019
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **2 Claims**



1. A gyro sensor block suspension comprising a sensor block having tnree gyro mounts for orthogonally mounting a triad of gyros, said gyros each having the same internal dither tuned suspension, two of said gyro mounts having a spring suspension machined into said sensor block, said spring suspensions being of different stiffnesses so as to act in series with said internal dither tuned suspension to reduce the gyro dither frequency.

4,534,649

SURFACE PROFILE INTERFEROMETER

Michael J. Downs, 'Karibu', Furza Hill Rd., Headley Down, Hampshire, England

Filed Oct. 22, 1982, Ser. No. 436,336
Claims priority, application United Kingdom, Oct. 30, 1981, 8132745
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—351 **10 Claims**

1. A surface profile interferometer comprises means for providing a collimated beam of radiation having components of equal amplitude in two orthogonal directions of polarisation;

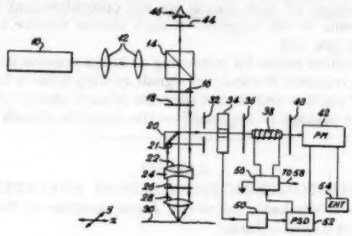
a beam directing device;

a birefringent focusing system for focusing radiation in the two directions of polarisation at different axial positions in space;

beam inversion means between the birefringent focusing system and the position of a test object; and

phase sensitive means for sensing any difference in phase between the polarised radiation components;

the beam directing device being such that it allows passage of at least a part of the collimated beam to the birefringent focusing system, receives from the birefringent focusing system radiation which has been reflected by the surface, and directs it to the phase sensing means, but introduces essentially no difference in phase between radiation components in the two orthogonal directions of polarisation.

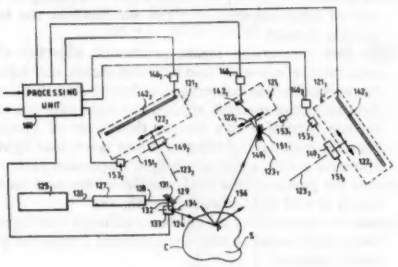


4,534,650

DEVICE FOR THE DETERMINATION OF THE POSITION OF POINTS ON THE SURFACE OF A BODY

Michel Clerget, La Celle Saint Cloud; Francois Germain, Limours; Jiri Kryze, Pontchartrain, and Robert Poujois, Sinard, all of France, assignors to INRIA Institut National de Recherche en Informatique et en Automatique, Le Chesnay, France

Filed Apr. 27, 1981, Ser. No. 257,630
Int. Cl.³ G06F *15/46*
U.S. Cl. 356—376 **36 Claims**



1. A device for remotely locating and contouring a body in space, comprising:

means remote from said body for illuminating a quasi-pinpoint region moving on the surface of said body;

view-taking means for taking views of said quasi-pinpoint region as it moves on the surface of said body from at least three different stations of said view-taking means to form at least three respective images lying in three different respective image planes, each of said stations comprising at least one row of discrete photosensitive elements, said rows being arranged and connected in said view-taking means to define a three-dimensional reference system, said view-taking means further including means for producing an image of said quasi-pinpoint region on each of said rows of photosensitive elements for each position of the quasi-pinpoint region on said surface of said body;

means responsive to signals from said rows of photosensitive elements corresponding to the same instantaneous position of the quasi-pinpoint region for determining the position in space of said quasi-pinpoint region whereby said body can be located and contoured in space, each of said sta-

tions being provided with a first and a second support each provided with a respective row of discrete photosensitive elements identifiable by their respective positions in the row of the respective support whereby positions of possibly faulty elements on the first and on the second support of each station are not coincident and the elements of the supports of each station receive identical images; and

evaluation means for producing an image position indication in response to electrical signals coming from at least one of the first and second supports of each station whatever the position of the image on the supports of each station.

4,534,651

PHOTOMETRIC BIOCHEMICAL ANALYZER

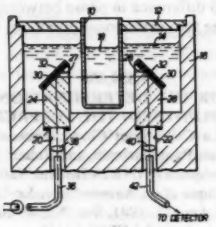
Tomiharu Minikane, Ohtawara, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Mar. 29, 1984, Ser. No. 594,993

Claims priority, application Japan, Mar. 29, 1983, 58-54674

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—440 **8 Claims**



1. Photometric analyzing apparatus comprising:

temperature controlled bath unit means including at least a pair of light entrance and exit windows at the bottom portion thereof;

light path conversion means positioned adjacent to said respective windows of said bath unit means, said light path conversion means comprising at least a first thin layer of light reflective material applied to a light path conversion surface thereof and a second thin layer of chemically resistant material covering said first layer, said light path conversion means defining a light inspection path;

means for positioning a fluid sample within said bath unit means in said light inspection path; and

means for transmitting a light beam through said light path conversion means to irradiate said fluid sample for photometric analysis.

4,534,652

MULTISHAFTED, CONTINUOUS MIXING AND KNEADING OF PLASTIFIABLE MATERIALS

Kurt Stade, Liestal, Switzerland, assignor to AUTOMATIK Apparate-Maschinenbau H. Hench GmbH, Grossostheim, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,495

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1982, 3206325

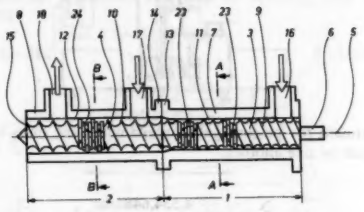
Int. Cl.³ B29B *1/10*

U.S. Cl. 366—85 **20 Claims**

1. A multi-shafted continuously operating mixing and kneading machine for plastifiable compounds with intermeshing axial elements rotating in the same direction at a constant axial worm separation, each of the axial elements being equipped with different zones with different numbers of threads along their directions of advance, with a zone having a smaller number of threads following a zone with a larger number of threads, characterized as follows:

(a) each axial element has successive zones (1,2) with worm elements (3,3'; 4,4') that engage one another so that the worm elements (3,3' or 4,4') of one zone (1 or 2) intermeshingly act upon one another in a self-cleaning fashion;

(b) the zone (2) with the smaller number of threads has a larger interior boring of its housing (8) and larger worm elements (4,4') than the zone (1) with the larger number of threads;



(c) the zone (2) with the smaller number of threads has a free cross-section (20) that is larger than in the preceding zone (1); and

(d) both zones (1,2) have fill openings (16,17) which can be charged independently of one another.

4,534,653

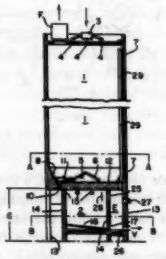
BLENDER FOR POWDERY MATERIAL

Robert Y. Courtay, Bretigny sur Orge, France, assignor to Fuller Company, Bethlehem, Pa.

Filed Feb. 16, 1984, Ser. No. 580,980

Int. Cl.³ B01F *13/02*

U.S. Cl. 366—106 **2 Claims**

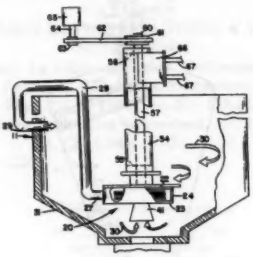


1. An apparatus for the storage and homogenization of powdery materials comprising an upper storage silo superimposed atop a homogenization chamber and separated by a slab; said upper storage silo including a plurality of feed points for raw material; the bottom of said silo being defined by said slab and including a cone having first fluidization elements mounted thereon and a plurality of circumferentially spaced apart generally vertical openings through the slab which define the outlet of the silo; each of said openings through slab being positioned at the center of a plurality of radiating second fluidization elements; said homogenization chamber including a plurality of circumferentially spaced apart openings in the upper part thereof, each flow connected to the outlet of the storage silo; the bottom of said chamber being generally flat and inclined toward a lateral outlet positioned on one side of the homogenization chamber; said bottom of the silo being adapted to fluidize material in the chamber by zones for homogenizing material therein; and an extraction column having an inlet at the bottom thereof flow connected to the lateral outlet of the homogenization chamber and an outlet in the upper portion thereof which serves as an outlet for the apparatus.

4,534,654
HIGH-SPEED FLUID BLENDER

Daniel M. Alt, Baltimore, and Michael J. Sackett, Glen Arm, both of Md., assignors to A. J. Sackett & Sons Co., Baltimore, Md.

Filed Jul. 27, 1983, Ser. No. 517,587
Int. Cl.[3] B01F *5/10*
U.S. Cl. 366—137 19 Claims



1. In a high-speed fluid blender having a mixing tank, wherein the tank is provided with a top portion and is further provided with a truncated frusto-conical bottom portion, and wherein the blender is intended for mixing chemical fertilizers which may include one or more granular ingredients in suspension in water, the improvement which comprises a combined means for mixing and recirculating the contents of the tank, including a pump assembly provided with a generally-cylindrical pump housing having respective side walls joined by an annular wall, one of the side walls having a central inlet opening formed therein substantially coaxially of the housing, first conduit means directing the liquid into the inlet opening of the pump from the frusto-conical bottom portion of the tank, the annular wall of the housing having a tangential discharge opening formed therein, second conduit means connecting the discharge opening with the top portion of the tank, an assembly of a plurality of spaced-apart parallel blades rotatably mounted within the housing and having a substantial radial clearance with respect to the annular wall of the housing, wherein the granular ingredients will not clog the pump assembly and will be mixed properly with the water, at least some of the blades having a central opening formed therein substantially coaxial with and in communication with the inlet opening in the one side wall, means extending through the other side wall of the housing for driving the blade assembly; wherein the pump assembly serves the dual fiunction of mixing and recirculating, whereby the necessity for a separate recirculating pump may be obviated, and means for injecting a liquid fertilizer under pressure to merge with the tangential discharge of the pump, thereby creating a turbulence to substantially relieve the "bumping" action caused by expansion of the pressurized liquid fertilizer upon contact with the liquid in the tank.

4,534,655
PROPORTIONING DEVICE

L. Tony King, and Mark W. Peters, both of Long Beach, Calif., assignors to Komax Systems, Inc., Long Beach, Calif.

Filed Sep. 24, 1984, Ser. No. 653,194
Int. Cl.[3] B01F *5/10, 15/02*
U.S. Cl. 366—137 11 Claims

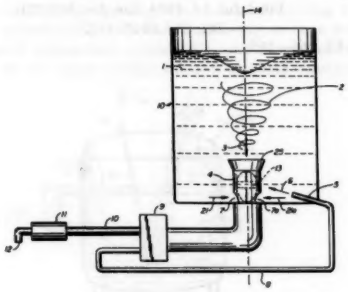
1. A device for maintaining a substantially uniform proportion between two or more liquids comprising:

a substantially cylindrically shaped tank for maintaining said liquids;

a liquid exit tube characterized as being located at the bottom and at approximately the radial center of said cylindrically shaped tank, said liquid exit tube being further characterized as possessing a flared top end and one or more openings at its bottom end;

means located within said liquid exit tube for the substantial elimination of the formation of a vortex at the downstream end of said liquid exit tube;

means for injecting said two or more liquids into said cylindrically shaped tank at a direction between approximately 0° and 45° above horizontal and approximately perpendicular to the radius of the cylindrically shaped tank;



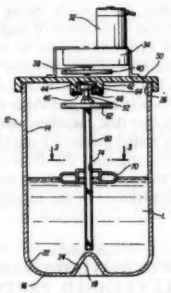
means for circulating said two or more liquids from and back into said cylindrically shaped tank; and

means for withdrawing a sample of the two or more liquids in a proportion substantially identical to the proportion of said liquids in said cylindrically shaped tank.

4,534,656
FLOATING MAGNETIC STIRRER WITH DRIVING GUIDE ROD

Norman A. de Bruyne, Princeton, N.J., assignor to Techne Corporation, Princeton, N.J.

Filed Jun. 7, 1983, Ser. No. 502,618
Int. Cl.[3] B01F *13/08*
U.S. Cl. 366—247 19 Claims



1. A magnetic stirrer apparatus for stirring liquid culture medium comprising:

(a) a flask having an opening in the upper part thereof,

(b) a closure for said opening,

(c) means for generating horizontal rotary motion and vertical circulating motion of liquid culture medium in said flask from the liquid surface substantially to the bottom of the flask and thence upwardly comprising:

(i) a driving guide rod in said flask,

(ii) a floating stirrer in said flask,

(iii) means for coupling said rod and stirrer for relative axial, non-rotational movement,

(iv) means for supporting said driving guide rod for axial rotational movement in said flask, and

(v) means for axially rotating said driving guide rod,

(d) said apparatus being free of means for generating turbulent flow in said flask.

4,534,657

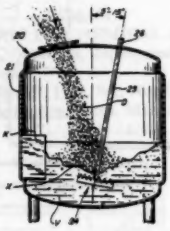
BLENDING AND EMULSIFYING APPARATUS

Maurice C. Clement, Cottage Grove, Wis., assignor to Crepaco, Inc., Lake Mills, Wis.

Filed Jul. 14, 1983, Ser. No. 513,921

Int. Cl.³ B01F 5/12

U.S. Cl. 366—265 **11 Claims**



1. An apparatus for blending and emulsifying a shearable first product with a viscous second product disposed within a tank to a predetermined level, the tank being provided with a first product inlet disposed above the level of the second product, said apparatus comprising a rotatably mounted agitator immersible within the second product, said agitator, when rotating at a predetermined speed, causing the second product to form a vortex into which the first product is deposited through the tank inlet; and drive means connected to said agitator and effecting rotation thereof at said predetermined speed; said agitator including a first disc member having means for connecting to said drive means, said first disc member being proximate the bottom of the tank, a second disc member axially spaced from said first disc member and provided with an enlarged central opening, a plurality of symmetrically arranged, annularly spaced baffles interconnecting said first and second disc members, each baffle being angularly disposed relative to the direction of rotation of said agitator for imparting a pumping and blending action to the first and second products causing portions of same to flow outwardly between the baffles towards the periphery of said disc members, and a plurality of symmetrically arranged shear blades provided on a periphery of at least one disc member, said shear blades being disposed at a greater radial distance from the axis rotation than said baffles and extending into the flow path of the pumped portions of the first and second products and effecting shearing of the first product entrained in the pumped portions.

4,534,658

MIXING APPARATUS, HAVING SEALS WHICH MAY BE SATISFACTORILY CLEANED, PARTICULARLY FOR THE PHARMACEUTICAL INDUSTRY

Jan W. De Vries, Zelhem, Netherlands, assignor to Isem B.V., An Doetinchem, Netherlands

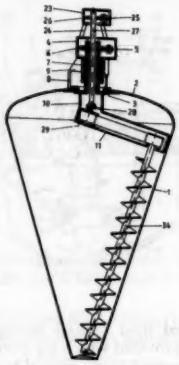
Filed May 29, 1984, Ser. No. 615,061

Claims priority, application Netherlands, Jun. 6, 1983, 8302015

Int. Cl.³ B01F 9/22

U.S. Cl. 366—287 **6 Claims**

1. In mixing apparatus comprising a conical container closed at its upper end by a cover and a mixing screw located in said container, said screw extending parallel to the conical wall of said end and having drive means for simultaneously rotating said screw about its axis and around the central axis of the container, comprising a central drive shaft extending through said cover, a radial arm connected at its inner end to said central drive shaft, said supporting the mixing screw at its outer end, the improvement wherein said radial arm comprises a closed tubular section terminating at its inner end in a vertical part extending into proximity with the cover and being connected to the central drive shaft, a sealing element removably arranged between said vertical part and the cover at the position of the passage of said vertical part through the cover, the



outer end of the tubular section having an opening, and a bearing structure located in said opening for rotatably supporting the upper end of the screw comprising a first bearing sleeve secured in the opening and a second bearing sleeve secured to the end of said screw, including a sealing structure removably arranged between the first bearing sleeve and the second bearing sleeve at the end of the screw.

4,534,659

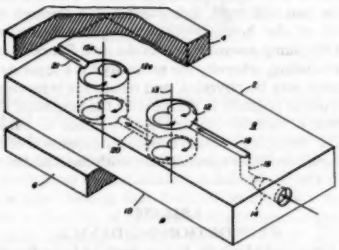
PASSIVE FLUID MIXING SYSTEM

Theodore A. Dourdeville, Southboro, and Anthony Lymneos, West Upton, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Jan. 27, 1984, Ser. No. 574,541

Int. Cl.³ B01F 5/06

U.S. Cl. 366—338 **12 Claims**



1. A passive fluid mixer comprising:

a cylindrical mixing chamber,

a fluid entrance passageway,

a fluid exit passageway,

the mixing chamber being adapted to receive fluid from the fluid entrance passageway and to produce a net fluid flow through the chamber to the exit passageway,

the entrance passageway and the exit passageway being located at opposite ends of the cylindrical mixing chamber and at right angles to the axis of the chamber,

the axis of the entrance passageway being an extension of a diameter of the cylindrical chamber to direct the flow of

the fluid entering the chamber against the cylindrical wall of the chamber on the opposite side of the axis from that on which the entrance passageway is located whereby the flow is changed by the confines of the chamber such that its momentum superimposes upon the net fluid flow through the chamber a pattern of motion dominated by paired counter-rotating vortices.

4,534,660

PORTABLE DEVICE INCLUDING A VISIBLE MECHANISM

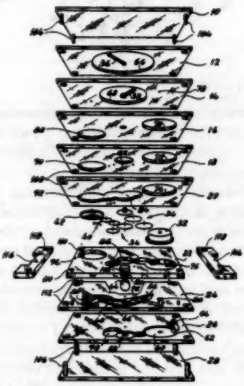
Claude Laesser, La Chaux-de-Fonds, Switzerland, assignor to ETA S.A., Fabriques d'Ebauches, Switzerland

Filed Jul. 5, 1984, Ser. No. 628,056

Claims priority, application Switzerland, Jul. 8, 1983, 3756/83

Int. Cl.³ G04B *19/02, 37/00*

U.S. Cl. 368—220 **6 Claims**



1. A portable device including a mechanism, said device comprising:

a source of energy;

a rotary drive member driven by said source;

a train of gear wheels and pinions driven by said rotary drive member;

a transparent front plate;

a back plate; and

a support structure positioned between said front and back plates, said support structure comprising a plurality of transparent plates which together with said front and back plates form a stack, at least a portion of said plurality of transparent plates comprising cutouts which in cooperation with adjacent plates define enclosures surrounding said source, said rotary drive member and said train of gear wheels and pinions.

4,534,661

ELECTRIC ALARM WRISTWATCH INCLUDING CYLINDRICAL SOUND TUBE FOR TRANSMITTING SOUND

Hirohisa Kurita, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

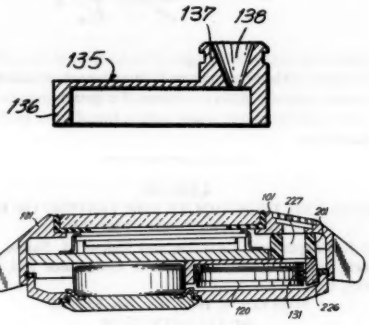
Continuation-in-part of Ser. No. 178,410, Aug. 15, 1980, which is a continuation of Ser. No. 936,997, Aug. 25, 1978, abandoned. This application Jun. 11, 1982, Ser. No. 387,561

Claims priority, application Japan, Aug. 25, 1977, 52-102109

Int. Cl.³ G04C *24/16*

U.S. Cl. 368—250 **9 Claims**

1. An electrical alarm wristwatch comprising a watch case having a display surface, side walls and a back side, said display surface formed with a display opening and a buzzer opening therethrough, a battery having a bottom surface, watch circuit means driven by said battery and time display means including an electro-optical display panel driven by said watch circuit disposed within said watch case in registration with said display opening for viewing said display means, alarm buzzer means having a bottom surface and being disposed within said watch case and driven by said battery, said display means overlapping at least a portion of said buzzer means and at least a portion of said buzzer means being in uninterrupted registration with said buzzer opening, a sound case including a substantially cylindrical buzzer chamber having an open bottom surface and a substantially cylindrical sound tube eccentrically disposed on the upper surface thereof, and said substantially



cylindrical buzzer chamber being hermetically engaged with said buzzer means, said substantially cylindrical sound tube disposed in said watch case communicating between said buzzer means and said buzzer opening for providing an uninterrupted route for transmitting the sound from said alarm buzzer means to said buzzer opening on the display side of said watch case, said upper surface of said cylindrical buzzer chamber having a diameter greater than said cylindrical sound tube, said electro-optical display panel overlapping said upper surface and wherein the bottom surface of said buzzer means and the bottom surface of said battery are disposed substantially on the same plane without overlapping each other.

4,534,662

DEVICE FOR DETECTING VAPOR LEAKAGES

Reinhold Barlian, Dieselstrasse 6, 6990 Bad Mergentheim, Fed. Rep. of Germany

PCT No. PCT/DE81/00114, § 371 Date Apr. 6, 1982, § 102(e) Date Apr. 6, 1982, PCT Pub. No. WO82/00521, PCT Pub. Date Feb. 18, 1982

PCT Filed Jul. 25, 1981, Ser. No. 367,242

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030296

Int. Cl.³ G01M *3/00*

U.S. Cl. 374—4 **10 Claims**

1. A device for detecting steam leaking from hollow bodies above ground including pipes for gauge pressure steam, comprising:

thermal insulation disposed around a said hollow body, there being between said insulation and body a space for measuring purposes,

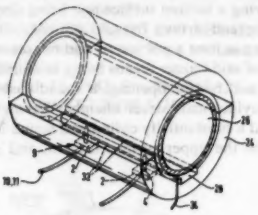
temperature change sensor means disposed in said space for providing at least one output signal response to a predetermined change in temperature in said space,

steam detector means having at least inlet means disposed in said space for providing at least one output signal in the event steam is sensed by the detector means in said space,

said steam detector means including at least one steam detector having a capacitor-like structure including a porous

insulating material able to take up steam through said inlet means, and

warning means connected to receive said output signals



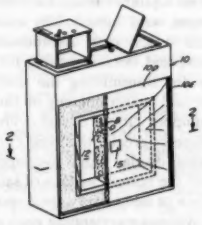
from both the temperature change sensor means and the steam presence detector means for providing an output only upon receiving a said output signal from each simultaneously.

4,534,663

MEANS AND TECHNIQUES FOR TESTING OF HEAT INSULATION MATERIALS

Heinz F. Poppendiek, La Jolla, and Cullen M. Sabin, Solana Beach, both of Calif., assignors to Geoscience Ltd, Solana Beach, Calif.

Filed Oct. 6, 1983, Ser. No. 539,665
Int. Cl.³ G01N *25/18*
U.S. Cl. 374—43 **4 Claims**



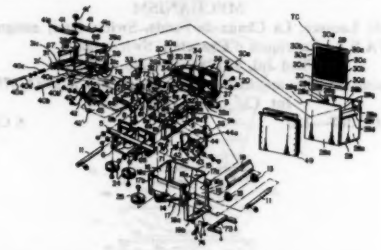
1. Insulation testing apparatus comprising, a single heat source; said heat source being a single elongated electrical heating element; said heat source being metal-clad along its length by a high heat conductivity metal material which is in good heat conducting relationship to said heating element and which is internally heated by said element such that the temperature of said metal material is substantially uniform along its length; metal material which is heated by said elongated electrical element with said two insulating materials each having an inner surface and an outer surface and with said inner surface of each insulating material being in direct contact with said metal material without any air space therebetween; means for measuring the difference in the quantity of heat conducted through said different insulating materials; said measuring means including a first thermopile means and a second thermopile means mounted on wall means in said apparatus and in thermal contact respectively with a corresponding outer surface of said two insulating materials without any air space therebetween such that heat flows solely by conduction and without radiation or convection from the heated metal-clad heat source through each of said two insulating materials to a corresponding one of said thermopile means, said first thermopile means measuring the amount of heat passing through one of said materials; and said second thermopile means measuring the amount of heat flowing through the other one of said insulating materials.

4,534,664

PRINTING MECHANISM HAVING A PLURALITY OF TYPE PLATES

Kazuyoshi Sawada, Kashiwazaki, Japan, assignor to Silver Seiko Ltd., Japan

Filed Apr. 22, 1983, Ser. No. 487,694
Claims priority, application Japan, Apr. 26, 1982, 57-68738
Int. Cl.³ B41J *7/54, 7/50*
U.S. Cl. 400—110 **15 Claims**



1. A print carrier for a printer of the type wherein said print carrier is mounted for movement along a path in a first horizontal direction in parallel with an axis of a platen, comprising: a first section mounted for movement in the first direction; a plurality of substantially planar type carrying elements each having a plurality of character types arranged in rows and columns thereon; a second section mounted below said platen for movement on said first section in a second horizontal direction perpendicular to the first direction; a third section removably received in said second section and containing said type carrying elements in equally spaced parallel vertical planes which are parallel to said path; first rail elements secured to said first section; second rail elements removably mounted on said first section; said first and second rail elements providing a pair of rail means for supporting and guiding said third section and said type carrying elements for movement in the second direction at a predetermined vertical position; said third section being able to be removed, when supported on said second rail elements, together with said type carrying elements contained therein from said second section by lifting said second rail elements; means for fixing said second rail providing elements to said first section; and lifting means on said first section for lifting one of said type carrying elements which is in a predetermined vertical plane to a selected vertical position for printing.

4,534,665

SERIAL PRINTER

Masahiko Mori; Kenichiro Arai, and Chikao Tezuka, all of Shiojiri, Japan, assignors to Epson Corporation and Kabushiki Kaisha Suwa Seikosha, both of, Japan

Filed Feb. 22, 1983, Ser. No. 468,625
Claims priority, application Japan, Feb. 22, 1982, 57-26979; Feb. 22, 1982, 57-26980
Int. Cl.³ B41J *1/50*
U.S. Cl. 400—145.2 **12 Claims**

1. A serial printer comprising:

print wheels in the form of annular rings supported on a common holder, said print wheels including a plurality of raised type positioned on and spaced around the outer peripheral surface of each said annular ring, said print wheels including at least a first group of printing types and a second group of printing types, each said printing types having a face;

a rotatable shaft supporting said print wheels on said common holder for corotation of said print wheels;

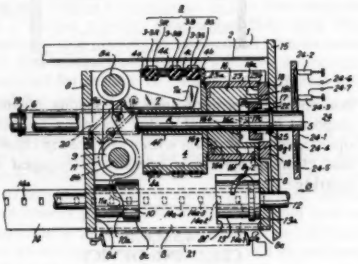
hammer means having a presser for selectively confronting and pressing the types of said print wheels from inside said

annular rings to press the face of a selected type on a sheet of recording paper;

a platen, said recording paper being positioned between said platen and said print wheels;

a carriage having mounted thereon said hammer means for laterally shifting said hammer means therewith successively from one print position to the next, said print wheels being mounted on said carriage; and

switching means for selectively bringing said presser of said hammer means into confronting relationship to a print wheel of said first group of printing types or alternatively in confronting relationship to a print wheel of said second group of printing types, said confronting relationship being determined during a lateral shifting stroke of said carriage between one printing position and the next printing position, wherein said carriage includes an engaging member fixedly attached thereto, said switch means including:



a first cam for translating said print wheels axially on said shaft, said first cam having a first stepped surface for engaging with said engaging member of said carriage during a lateral shifting stroke of said carriage to position said presser in confronting relationship to a print wheel of said first group of print types, and a second stepped surface for alternatively engaging with said member of said carriage during said lateral shifting stroke of said carriage to position said presser in confronting relationship to a print wheel of said second group of print types;

a second cam engageable with said first cam for rotating said first cam, and

means for stopping rotation of said second cam so as to selectively position said engaging member of said carriage into confronting relationship to said first stepped surface or alternatively to said second stepped surface.

4,534,666

TRANSFER MATERIAL FEEDING DEVICE

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 11, 1984, Ser. No. 619,214

Claims priority, application Japan, Jun. 13, 1983, 58-105309

Int. Cl.[3] B41J *35/00*

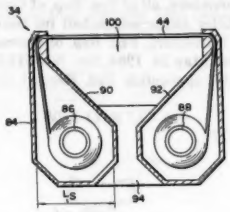
U.S. Cl. 400—207 **6 Claims**

1. A transfer material feeding device capable of being set in a transfer apparatus which transfers a color agent to a sheet in accordance with a latent image to form an image on the sheet, comprising:

a transfer material in the form of a sheet and having two end portions, said transfer material including the color agent;

a pair of roll shafts individually engaging two end portions of the transfer material and wound with the transfer material, whereby the transfer material is fed in one direction; and

a case integrally enclosing the pair of roll shafts and the transfer material and opening on one side thereof so that part of the transfer material located between the two roll shafts is exposed, said case also having a slit in a surface other than said one side, said slit cooperating with a holder in said transfer apparatus so that the transfer material



feeding device is guided through the slit onto the holder to be held thereby when the transfer material feeding device is set in the transfer apparatus.

4,534,667

DRIVE MECHANISMS FOR INKED RIBBON CASSETTES

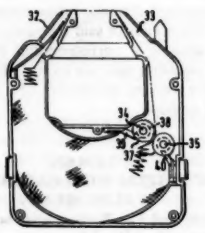
John E. Bury, Eltham, England, assignor to Grafton Limited, London, England

Filed Oct. 11, 1983, Ser. No. 540,730

Claims priority, application United Kingdom, Oct. 13, 1982, 8229194; Jan. 17, 1983, 8301159

Int. Cl.[3] B41J *35/28, 33/28*

U.S. Cl. 400—207 **3 Claims**



1. A stuffed inked ribbon cassette comprising a cassette body having a continuous loop of inked fabric ribbon thereon that is withdrawn past tensioning means from a stuffing chamber in the body and is returned to said stuffing chamber by a ribbon drive mechanism, said drive mechanism comprising a drive gear and an idler gear which are in gripping engagement with a portion of said ribbon and between which the ribbon passes, the said drive and idler gears each being journalled at fixed centers in the cassette body, and each of said gears having teeth of ratchet form with each of the drive gear teeth having a generally radial front face and an inclined rear face and each of the idler gear teeth having a generally radial rear face and an inclined front face, said ribbon being engaged between said generally radial faces of said drive and idler gears and returned to the stuffing chamber.

4,534,668
PHOTOELECTRIC KEYBOARD

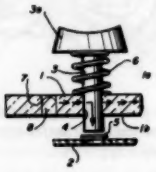
Heinz Hildel, Nuremberg; Wolfgang Schnell, Furth, and Gerald Westphal, Nuremberg, all of Fed. Rep. of Germany, assignors to Triumph-Adler Aktiengesellschaft fur Buro- and Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed May 24, 1984, Ser. No. 613,270

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323989

Int. Cl.[3] **B41J** *5/08*

U.S. Cl. 400—477 **5 Claims**



1. A photoelectric keyboard for typewriters and similar machines comprising

a first light transparent plate having holes extending from the upper to the lower surfaces thereof,

a light source mounted in at least one of said holes in said first transparent plate for internally illuminating said first transparent plate,

keys having light transparent key stems mounted in others of said holes for movement between normal and depressed positions, said key stems remaining in said holes both in said normal and said depressed positions, light in said illuminated first transparent plate continuously illuminating said transparent key stems and radiating from the lower ends of said transparent key stems,

a second plate parallel to and spaced from said first transparent plate comprising a printed circuit board, and

photo elements mounted on said printed circuit board opposite and spaced from the radiating ends of said transparent key stems by a predetermined distance established by the spacing between said first and second plates,

said predetermined distance being such that light radiated from the lower ends of said transparent key stems is sufficient to activate a corresponding photo element only when the radiating ends are moved close to said photoelements in response to movement of a key from normal to depressed position.

4,534,669
CLEANING SYSTEM WITH CARTRIDGE HAVING VALVE MEANS

Samuel C. Heck, and Lee E. Garrison, both of San Antonio, Tex., assignors to Sani-Fresh International, Inc., San Antonio, Tex.

Filed Mar. 24, 1983, Ser. No. 478,516

Int. Cl.[3] **A46B** *11/00, 11/02*

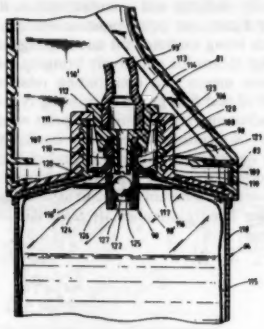
U.S. Cl. 401—134 **14 Claims**

1. A cleaning fluid cartridge, adapted for use with a cleaning system having a handle with a piercing member disposed on one end thereof and a surface cleaning means disposed on the other end thereof, comprising:

a flexible bag, adapted to contain a cleaning fluid, and having an opening therein; and

a check valve sealingly disposed within said opening, said valve having: an inlet orifice; an exit orifice; a sealing chamber therebetween; a sealing member moveable within said sealing chamber; a first open operating position which allows said cleaning fluid to pass through said valve; a second sealed operating position to prevent egress of said cleaning fluid through said valve; a third sealed non-operating position which allows said cleaning fluid to be stored within said flexible bag;

said bag and said valve cooperating with said piercing member to move said sealing member from said third sealed



non-operating position into said sealing chamber to be disposed in either said sealed operating position or said open operating position within said sealing chamber when said cleaning system is operatively engaged with said cartridge.

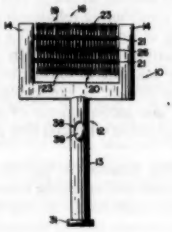
4,534,670
CLEANING DEVICE

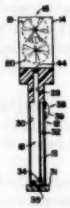
Elias Facuseh, 1147 SW. 78 Ct., Miami, Fla. 33144

Continuation of Ser. No. 411,304, Aug. 25, 1982. This application Nov. 16, 1983, Ser. No. 552,111

Int. Cl.[3] **A46B** *11/04;* **A47L** *13/22;* **B26B** *11/00*

U.S. Cl. 401—270 **4 Claims**





1. A cleaning assembly for a comb or like device, said cleaning assembly comprising:

(a) a housing having cleaning means attached thereto in accessible position for cleaning of a given device, said cleaning means including at least two cleaning elements each rotatably mounted on said housing and positioned in

a substantially stacked, parallel relation to one another, said cleaning element being structured for intermeshing engagement with one another, whereby rotation of one of said cleaning elements causes rotation of the other of said cleaning elements,

(b) a first compartment and a second compartment each integrally formed on the interior of said housing and disposed in adjacent relation to one another, said housing including a common wall extending along the length of both said first and said second compartments and disposed in physically segretating relation thereto,

(c) valve means for regulating passage of fluid into and out of said housing and comprising a first valve assembly and a second valve assembly, said second valve assembly disposed and structured to regulate fluid flow from said first compartment directly onto at least one of said cleaning elements,

(d) said first valve assembly movably mounted in said common wall between a first position establishing fluid flow from said second compartment to said first compartment and a second position establishing fluid flow from an exterior of said housing to said second compartment,

(e) said first compartment having a hollow interior portion structured for storage of cleaning fluid therein and disposed for delivery of the cleaning fluid directly to said cleaning means via said second valve assembly,

(f) said second compartment having a hollow interior structured for containment of air therein and disposed in cooperative, fluid communication with said first valve assembly to provide exclusion of cleaning fluid from said second compartment interior and air passage from said second compartment to said first compartment and subsequently from an exterior of said housing into said second compartment,

(g) activating means disposed and structured to substantially define a portion of the interior of said second compartment and including a flexible wall portion capable of displacement between a first driving position and a second driving position thereby changing the effective volume of said second compartmemt,

(h) said first valve assembly positionable in said first position upon inward placement of said flexible wall portion by depression of said activating means into said first driving position, said first valve assembly positionable in said second position upon expansion of said flexible wall portion defining said second driving position of said activating means,

(i) said first driving position of said activating means defined by air flow from said second compartment to said first compartment via said first valve assembly and concurrent cleaning fluid flow from said first compartment to said cleaning means,

(j) vent means mounted on said housing for supplying air to the interior thereof and being disposed in direct fluid communication of said first valve assembly, said first valve assembly structured and disposed to interconnect said second compartment with said vent means independent of said first compartment when said actuating means assumes said second driving position, and

(k) whereby cleaning fluid is forced directly from said first compartment to said cleaning means and in segregated relation to said second compartment.

4,534,671

HOLDER WITH A STACK OF SHEETS

Rainer Häfner, Herrnstrasse 61 D-6050, Offenbach am Main, Fed. Rep. of Germany

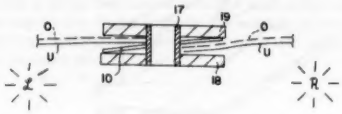
Filed Mar. 7, 1983, Ser. No. 472,755

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1982, 3208314

Int. Cl.[3] **B42F** *13/00, 3/00;* **B42D** *15/00*

U.S. Cl. 402—80 R **5 Claims**

1. A holder comprising a pin and annular member with a stack of sheets (13), each of said sheets being provided with a circular hole (14), a slot (15) extending from said hole (14) to an edge of said sheet, and a V-shaped cutout (16) communicating with said hole and being diametrically opposed to said slot (15), an annular flexible member (10) passing obliquely upwards through said slot (15) and said cutout (16) in said sheets (13), said annular member (10) arranged so that approximately one half thereof is below said stack of sheets and the other half above it.



4,534,672

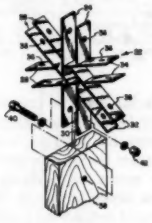
HUB FOR GEODESIC DOME CONSTRUCTION

James E. Christian, III, Rte. 2, Box 274, McKinney, Tex. 75069

Filed Feb. 23, 1984, Ser. No. 582,822

Int. Cl.[3] **E04B** *1/32*

U.S. Cl. 403—172 **7 Claims**



1. A hub for use in the construction of geodesic domes comprising:

a plurality of pairs of elongate plate members,

each of said plurality of pairs of elongate plate members comprising two elongate plate members of dissimilar length, each having an orifice disposed a selected distance from one end thereof,

each of said two elongate plate members being disposed in spaced apart parallel relationship, one with the other, with said orifice in one elongate plate member being aligned with said orifice in the other elongate plate member, and

each of said pairs of elongate plate members being interconnected at at last three points with said plurality of pairs of elongate plate members wherein a central junction is formed with said plurality of pairs of elongate plate members extending outward therefrom.

4,534,673

ELASTOMERIC PAVEMENT MARKER

David C. May, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

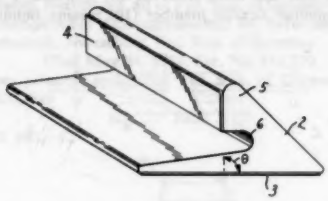
Filed Apr. 11, 1983, Ser. No. 483,603

Int. Cl.[3] **E01F** *9/06*

U.S. Cl. 404—14 **9 Claims**

1. A roadway marker comprising a body having a base which can be attached to the surface of a roadway without requiring a recess or hole in the roadway, and which has a raised surface adapted to face oncoming traffic when the marker is mounted on a roadway, and a reflective material

attached to said raised surface on the side adapted to face oncoming traffic, said body being made of a cellular elastomer



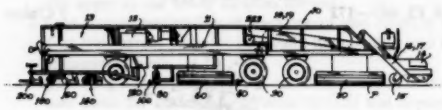
having a compressive strength of 25 percent compression at less than about 100 kPa.

4,534,674

DUAL-LIFT REPAVING MACHINE

Earl F. Cutler, Lawrence, Kans., assignor to Cutler Repaving, Inc., Lawrence, Kans.

Filed Apr. 20, 1983, Ser. No. 486,726
Int. Cl.³ E01C *23/00*
U.S. Cl. 404—75 **22 Claims**



1. A road resurfacing machine comprising, in combination, a chassis, preliminary heater means depending from the chassis and located adjacent the road surface; preliminary scarifier means depending from the chassis and spaced apart from the preliminary neater means for carifying a heated road surface; main heater means depending from the chassis and located adjacent the pavement behind the preliminary scarifier means for heating scarified road material; main scarifier means depending from the chassis and spaced apart from the primary heater means for further scarifying hot road material and the road surface; spray means depending from the chassis for spraying liquid asphalt over hot, scarified material; ramp means located behind the main scarifier means and in front of the spray means; rotor means associated with the ramp means for causing scarified road material to travel up the ramp and for whipping the traveling scarified material through the air past the spray means; first macadam dispensing means carried by the chassis and located behind the spray means for dispensing new hot mix material on the hot sprayed material and road surface; first mixing means located behind the first macadam dispensing means for commingling the the newly-added hot mix material with the hot, sprayed material on the road surface; first screed means connected to the chassis for leveling the hot, mixed material to form a first lift; second macacam dispensing means carried by the chassis and located behind the first screed means for dispensing additional new hot mix material atop the mixed, leveled material on the road surface; second mixing means carried by the chassis behind the second macadam dispensing means for spreading the additional new hot mix material over the first lift; and second screed means connected to the

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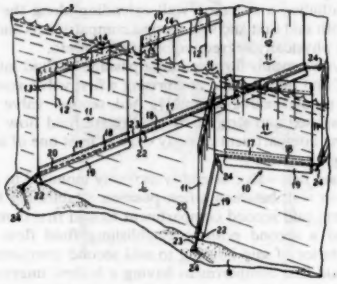
4,534,675

ARTIFICIAL SEAWEED

John P. Morrisroe, 283 Park Dr., Palatine, Ill. 60067

Filed Sep. 26, 1983, Ser. No. 535,792
Int. Cl.³ E02B *3/04*
U.S. Cl. 405—24 **12 Claims**

3. In a body of water having a bottom bed of particulate material, artificial seaweed deployed in said body which comprises a plurality of sheets of flexible water resisting buoyant plastics material, said sheets having folded over bottom ends, spaced parallel seals uniting the folded over ends to the sheet forming superimposed adjacent sleeves along the widths of the sheets, slits extending from the top edges of the sheets providing individual fingers across the widths of the sheets, pockets



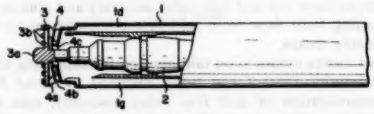
on the upper ends of the fingers, floats in said pockets, lake bed sediment filling the bottom sleeves holding the sheets on the lake bed bottom, a flexible rope threaded through the sleeves superimposed adjacent the sediment filled bottom sleeves of the sheets, and anchors on the rope whereby the sheets are maintained in a fixed fence row position on the lake bed bottom.

4,534,676

EXCAVATING AND PROPELLING MACHINE FOR LAYING PIPELINES UNDERGROUND

Hiroshi Saito, Isehara, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 22, 1983, Ser. No. 564,525
Claims priority, application Japan, Dec. 23, 1982, 57-194011
Int. Cl.³ F16L *1/00*
U.S. Cl. 405—184 **2 Claims**

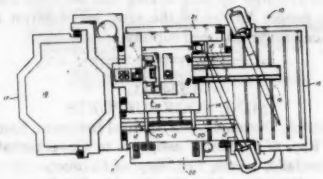


1. An excavating and propelling machine for laying pipelines underground, comprising a disk-shaped rotating cutter head having a plurality of excavating bits and a plurality of excavated earth and sand intake ports and adapted to be mounted on the leading end of a pilot excavator device body arranged to propel underground ahead of a pipeline to be laid underground; a plurality of rod-shaped rotary teeth formed integrally on the rear face of said cutter head in a manner of extending radially at uniform intervals spaced apart from one another; an annular front face plate having a plurality of excavated earth and sand passage holes communicating with the inside of said pilot excavator device body and located adjacent and opposite to said cutter head; and a plurality of rod-shaped stator teeth formed integrally on the front surface of the front face plate in a manner of extending radially at uniform intervals spaced apart from one another, said rotary teeth and said stator teeth forming in combination a plum-pudding stone crusher device.

4,534,677
SECONDARY CAPPING BEAMS FOR OFFSHORE DRILLING PLATFORMS

Edward K. Albaugh, Houston, Tex., assignor to Dolphin Titan International, Inc., Houston, Tex.

Filed Feb. 6, 1984, Ser. No. 577,265
Int. Cl.³ E02D 21/00
U.S. Cl. 405—203 7 Claims



1. A cantilever support means having a pair of secondary capping beams, and being secured to an existing drilling platform structure and extending therebeyond for supporting modified, self-contained drilling rigs, said existing drilling platform structure comprising,

a platform structure secured to four main supporting columns,

said modified self-contained drilling rigs being of sufficient size and weight to accommodate drilling and associated production equipment for drilling multiple wells, said modified drilling rig further comprising,

a pump package and a pipe rack deck supported on one extended end of the secondary capping beams,

an engine package and main quarters package cantilevered on the opposed extended end of said secondary capping beams,

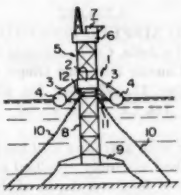
combination tank and mud processing packages disposed on center wing deck areas on the main deck of said platform between said pump package and engine package, and

a drilling substructure mounted on a skid base between said packages.

4,534,678
OFFSHORE STRUCTURE AND METHOD OF CONSTRUCTING SAME

Takuzo Nakazato, Abiko; Koichiro Okuto, Tokyo, and Toshio Kai, Kashiwa, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Feb. 10, 1983, Ser. No. 465,482
Claims priority, application Japan, Feb. 24, 1982, 57-28604; Feb. 24, 1982, 57-28605
Int. Cl.³ E02B 17/00
U.S. Cl. 405—204 9 Claims

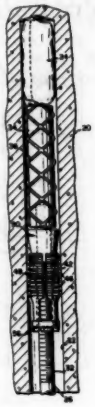


1. An offshore structure comprising a jacket assembly, a bottom tank secured to the bottom of said jacket assembly for providing ballast to said jacket, a movable tank and means for connecting said movable tank to said jacket so that said movable tank is vertically slidable along said jacket assembly, said movable tank being positionable on said bottom tank for providing ballast and storage, said movable tank being positionable spaced from said bottom tank for providing flotation to said structure, said means for connecting including a supporting frame movably coupled with said jacket assembly, a plurality of brackets connecting said movable tank to said supporting frame, and a guide mechanism between said jacket assembly and said supporting frame to guide the vertical sliding of said movable tank, and a buffer disposed between said jacket assembly and movable tank.

4,534,679
COMBINATION EXPANSION SHELL AND RESIN SECURED MINE ROOF ANCHOR ASSEMBLY

Claude C. White, Birmingham, and Frederick Carr, Tuscaloosa, both of Ala., assignors to Birmingham Bolt Company and Jim Walter Resources, Inc., both of Birmingham, Ala.

Division of Ser. No. 349,006, Feb. 16, 1982, Pat. No. 4,483,645.
This application Nov. 1, 1984, Ser. No. 667,139
Int. Cl.³ E21D 20/02
U.S. Cl. 405—261 6 Claims



1. A mine roof anchor assembly in combination with a dual compartment, resin and catalyst cartridge inserted into a mine roof opening, the anchor assembly including

(a) an elongated bolt having a head at one end, an unthreaded portion at the head end of the bolt and a threaded portion at the opposite end thereof

(b) a mixing and securing member engaged with the threaded portion of said elongated bolt, and rotatable therewith, for mixing the resin and catalyst

(c) an expansion member carried by said elongated bolt adjacent said mixing and securing member

(d) the resin and catalyst cartridge being ruptured by said mixing and securing member when the latter is forced upwardly into the mine roof opening, thereby permitting the resin and catalyst to gravitate downwardly between the wall of the opening and said mixing and securing member

(e) a first means threadedly engaged with the threaded portion of said elongated bolt a predetermined distance from the unthreaded portion of the elongated bolt, and in supporting engagement with said expansion member

(f) said expansion member frictionally engaging the wall of the mine roof opening during rotation of the elongated bolt and said mixing and securing member, to prevent rotation of the expansion member

(g) a second means threadedly engaged with the threaded portion of the elongated bolt and adapted to operatively engage said expansion member for urging the latter into gripping engagement with the mine roof

(h) said expansion member, first means and second means moving longitudinally of the elongated bolt upon rotation of the latter until said first means engages the unthreaded portion of the elongated bolt, continued rotation of the elongated bolt effecting actuation of said expansion member into gripping engagement with the mine roof

(i) the number of revolutions required to move said first means to the unthreaded portion of the elongated bolt corresponding to the number of revolutions required by said mixing and securing member to effect proper mixing of the resin and catalyst after the resin cartridge has been ruptured.

4,534,680

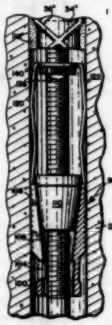
COMBINATION EXPANSION SHELL AND RESIN SECURED MINE ROOF ANCHOR ASSEMBLY

Claude C. White, Birmingham, and Frederick Carr, Tuscaloosa, both of Ala., assignors to Birmingham Bolt Company and Jim Walter Resources, Inc., both of Birmingham, Ala.

Division of Ser. No. 349,006, Feb. 16, 1982, Pat. No. 4,483,645. This application Nov. 1, 1984, Ser. No. 667,140

Int. Cl.³ E21D *20/02*

U.S. Cl. 405—261 **7 Claims**



1. A mine roof anchor assembly in combination with a dual compartment resin and catalyst cartridge inserted into a mine roof opening, the anchor assembly including

(a) an elongated bolt having a head at one end and threaded for a portion of its length at the other end

(b) a mixing and securing member carried by said elongated bolt

(c) an expansion member carried by said elongated bolt adjacent said mixing and securing member

(d) the resin and catalyst cartridge being ruptured by said assembly when it is forced upwardly into the mine roof opening, thereby permitting the resin and catalyst to gravitate downwardly between the wall of the opening and said mixing and securing member

(e) a nut threadedly engaged with said elongated bolt, and in supporting engagement with said expansion member

(f) stop means for holding said nut in fixed engagement with said elongated bolt, said stop means comprising distorted threads on the threaded portion of the elongated bolt

(g) said expansion member frictionally engaging the wall of the mine roof opening during rotation of the elongated bolt, and said mixing and securing member, to prevent rotation of the expansion member

(h) a wedge member threadedly engaged with said elongated bolt for engagement with said expansion member, to urge the latter into gripping engagement with the mine roof, and

(i) means for preventing rotation of said wedge member

(j) said wedge member being initially positioned on said elongated bolt in predetermined longitudinally spaced relation to said expansion member whereby, upon rotation of said elongated bolt relative to said expansion member, said wedge member moves longitudinally of said elongated bolt until said wedge member engages said expansion member, and continued rotation causes said wedge member to activate said expansion member into gripping engagement with the mine roof

(k) the number of revolutions of said elongated bolt required to move said wedge member into engagement with said expansion member corresponding to the number of revolutions required by said mixing and securing member to effect proper mixing of the resin and catalyst after the resin cartridge has been ruptured.

4,534,681

MINE ROOF SUPPORTS

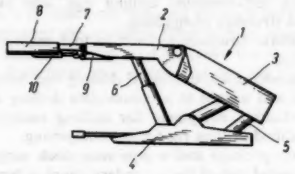
Walter Weirich, Dortmund, and Michael Dettmers, Kamen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,524

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1982, 3237719

Int. Cl.³ E21D *15/44*

U.S. Cl. 405—294 **4 Claims**



1. A mine roof support, comprising: a main roof-engaging structure (2), a multi-part auxiliary roof-engaging structure carried by the main structure and including a first component (7) pivotably linked to the main structure and a second component (8) slidably displaceable to extend and retract in relation to the first component, first hydraulic means (9) for setting the auxiliary structure against the roof of a mine working, second hydraulic means (10) for slidably displacing the second component in relation to the first component of the auxiliary roof-engaging structure, and hydraulic control means (16–18) operatively associated with the first and second hydraulic means for automatically reducing the setting pressure applied to the auxiliary structure by the first hydraulic means in response to the second hydraulic means being actuated to displace the second component of the auxiliary roof-engaging structure in relation to the first component thereof, to thereby maintain a temporarily reduced but still adequate support of a forward zone of the roof while simultaneously enabling the more facile displacement of the second component.

4,534,682

HAND AIRFEED POWERTOOL

Ronald F. Carlson, La Jolla, Calif., assignor to General Dynamics Corporation/Convair Div., San Diego, Calif.

Filed Dec. 27, 1982, Ser. No. 453,308

Int. Cl.³ B23B *45/04*

U.S. Cl. 408—14 **5 Claims**

1. In combination with a drilling tool having an outer housing and a drill bit feed assembly attached to said housing for controlling the rate of feed and depth of the drill bit toward and into a workpiece comprising:

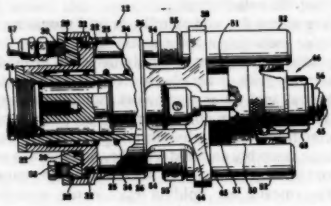
a piston fixedly attached to said housing, said piston having a face portion;

a cylinder carried by said piston for relative translation thereto;

hydraulic damper means attached to said cylinder and having translating means continually bearing against the face

portion of said piston within the cylinder to regulate the movement of said piston relative to said cylinder; and

a stop member for controlling the length of relative travel of said cylinder and piston, said stop member comprises a



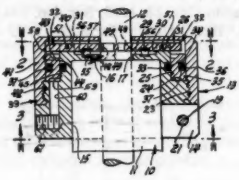
bolt threadedly engaging said cylinder and penetrating a selected depth into said cylinder for piston face engagement to control the depth of said drill bit into said workpiece.

4,534,683

RECIPROCATING DRILL FEED CONTROL ROD HOLDING MEANS

Joel D. Colliau, Northville, Mich., assignor to Ace Controls, Inc., Farmington, Mich.

Filed Jan. 20, 1984, Ser. No. 572,463
Int. Cl.³ B23B 47/22
U.S. Cl. 408—17 **4 Claims**



1. A holding means for use with a reciprocating tool apparatus controlled by a constant velocity hydraulic feed control apparatus having a feed control rod, and wherein the holding means operates to hold the feed control rod in successive advanced positions during feeding of a tool into a workpiece by the reciprocating tool apparatus in alternate advancing and retracting steps, characterized in that, said holding means includes:

(a) a cylindrical body having a recess in one end for the releasable mounting reception of a constant velocity feed control apparatus, and having a recess end wall through which is slidably mounted the feed control rod which is engageable by the reciprocating tool apparatus during successive advancing tool movements for moving the feed control rod inwardly of the feed control apparatus against the hydraulic resistance created by the feed control apparatus;

(b) a pair of yoke members pivotally mounted in diametrically opposite positions on the cylindrical body end wall, and each yoke having a semi-circular feed control rod engaging recess disposed in close proximity to the periphery of the feed control rod;

(c) a biasing means mounted between said yoke members and said body end wall and biasing said yoke members into frictional holding engagement with the feed control rod to hold it in an advanced position when the reciprocating tool apparatus retracts a tool from a workpiece, and wherein said biasing means allows the yoke members to be pivoted into a released position from the feed control rod during an inward movement of the same, into the constant velocity hydraulic feed control apparatus during an advancing tool movement by the reciprocating tool apparatus;

(d) a cover member releasably mounted on the holding means cylindrical body and having an end wall with an opening through which the feed control rod extends;

(e) an annular piston cylinder formed between said cover and said cylindrical body, and having mounted therein an axially movable circular piston; and,

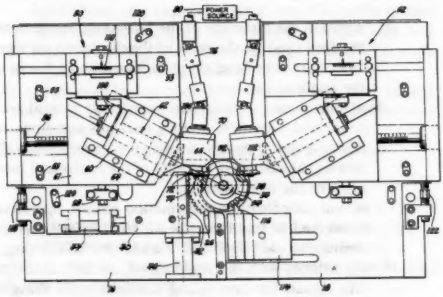
(f) a passageway means in said cylindrical body for admittance of fluid under pressure into the piston cylinder beneath the circular piston to move it in one axial direction to move the yoke arms into a feed control rod releasing position, to permit the feed control rod to be moved to an initial operating position, outwardly of the constant velocity hydraulic feed control apparatus, to an initial position for the beginning of another succession of advancing and retracting tool operations by the reciprocating tool apparatus.

4,534,684

APPARATUS FOR MILLING A GEAR FOR A DOUBLE ENVELOPING WORM GEAR DRIVE

Bernard H. Johnson, Plymouth, Mich.

Filed Sep. 30, 1982, Ser. No. 431,724
Int. Cl.³ B23F 9/14
U.S. Cl. 409—26 **17 Claims**



1. A method for cutting the flank of a straight-sided tooth of a double-enveloping worm drive gear, comprising the steps of:

supporting a gear blank having a first axis of rotation in a fixed position during cutting, and a base circle with a center lying on said first axis; and

engaging a cutting member rotating about an axis with the gear blank along a first linear path of motion tangential to said base circle while progressively tilting the cutting member as it is being moved in a rotating cutting motion from the tip to the root of the tooth being formed.

4,534,685

TRACER CONTROL SYSTEM

Hidetsugu Komiya, Hino, and Etsuo Yamazaki, Hachioji, both of Japan, assignors to Fanuc Ltd., Tokyo, Japan

PCT No. PCT/JP82/00118, § 371 Date Dec. 1, 1982, § 102(e) Date Dec. 1, 1982, PCT Pub. No. WO82/03590, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 9, 1982, Ser. No. 451,152
Claims priority, application Japan, Apr. 10, 1981, 56-54149
Int. Cl.³ B23Q 35/14; H02P 7/06; G06F 15/46
U.S. Cl. 409—99 **7 Claims**

1. A tracer control system for performing tracing of a model in an arbitrary direction to cut a workpiece using a cutter on a feed shaft, according to the tracing, said tracer control system comprising:

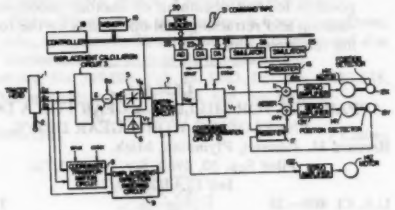
a tracer head for tracing the surface of the model and generating displacement signals; and

a combination tracer control-numerical control unit, comprising:

a numerical control unit, operatively connected to the cutter, for performing numerical control of the cutting of the workpiece by the cutter, comprising signal generating means for generating an angle signal indicating an angle of horizontal movement of the feed shaft on the basis of numerical control information; and

a tracer control unit, operatively connected to the cutter, said tracer head and said numerical control unit, for performing tracer control according to the displacement signals from said tracer head to control the cutting of the workpiece by the cutter, comprising:

a first coordinate transformation circuit, operatively connected to said tracer head and said signal generating means, for producing a displacement component



signal in the direction of the horizontal movement of the feed shaft on the basis of the displacement signals from the tracer head along an X-axis and a Y-axis and the angle signal;

feed rate means, operatively connected to said tracer head, said numerical control unit and said first coordinate transformation circuit, for generating a feed rate signal indicating velocity of the horizontal movement of the feed shaft; and

a second coordinate transformation circuit, operatively connected to said tracer head, said signal generating means and said feed rate means, for converting, in accordance with the angle signal, the feed rate signal into signals for controlling the feed rates along the X-axis and the Y-axis.

4,534,686

SPINDLE HEAD UNIT

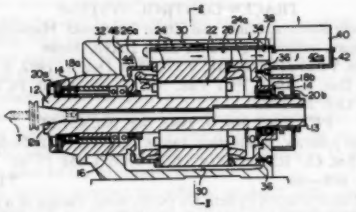
Kosei Nakamura, and Yoshikazu Takano, both of Hino, Japan, assignors to Fanuc Ltd., Hino, Japan

Filed Jan. 6, 1983, Ser. No. 455,987

Claims priority, application Japan, Jan. 8, 1982, 57-1006; Jan. 8, 1982, 57-1007

Int. Cl.[3] **B23B** *19/02*

U.S. Cl. 409—135 **4 Claims**



1. A spindle head unit for use in a machine tool, comprising:

an outer framework having a mounting space therein;

a spindle extending axially in said mounting space of said outer framework, said spindle having front and rear portions, wherein said spindle includes a bore in the front portion thereof for receiving a tool therein;

front bearing means for supporting the front portion of said spindle and rear bearing means for supporting the rear portion of said spindle, wherein said spindle is rotatable about the axis thereof;

a drive motor for said spindle, in said mounting space, said motor including a rotor assembly rotatably fixed on said spindle and a stator assembly disposed around said rotor assembly with an annular space between said stator assembly and said outer framework, said annular space being connected to the atmosphere via air ports formed in said outer framework, wherein a gap is formed between said stator assembly and said front bearing means such that said front bearing means does not contact said stator assembly;

holding means for holding said stator assembly in said mounting space, said holding means defining at least an axial through-bore having one end fluidly interconnected with said annular space in said mounting space and the other end fluidly connected to the outside of said outer framework, wherein said holding means are cantilever holding means for holding only the rear portion of said stator assembly, thereby thermally isolating said stator assembly from the front portion of said spindle; and

a means for forming a stream of cooling air, wherein the stream of cooling air passes through said annular space and said axial through-bore and is then discharged to the outside of said outer framework.

4,534,687

POLYMERIC BELT CUTTING APPARATUS

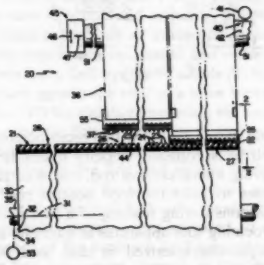
G. Brian Hetz, 1733 E. Holiday, Springfield, Mo. 65807

Division of Ser. No. 267,189, May 26, 1981, Pat. No. 4,496,269.

This application Oct. 24, 1983, Ser. No. 544,928

Int. Cl.[3] **B23C** *3/04, 3/28;* **B29H** *7/22*

U.S. Cl. 409—157 **14 Claims**



1. In an apparatus for cutting a non-contoured and cured polymeric belt sleeve to define an endless power transmission belt construction having a plurality of alternating annular belt projections and grooves; each of said grooves having a pair of symmetrical radially diverging side walls; said apparatus comprising a mandrel for supporting said belt sleeve for rotation about a longitudinal axis; means for rotating said mandrel and belt sleeve about said longitudinal axis; a rotatable cutting instrument having axially spaced cutting projections for cutting said annular grooves; means for rotating said cutting instrument; each of said cutting projections having integral cutting means for cutting an associated pair of said symmetrical side walls of an associated groove; and means for moving said cutting instrument toward and away from said sleeve; said moving means being adapted to urge said cutting instrument during rotation thereof against the rotating belt sleeve to define said belt construction; the improvement in which said cutting instrument comprises a first support body having a first central axis, a first plurality of rake-like cutting bars each having an elongate axis and each having integral spaced parallel teeth which define said cutting projections and are disposed perpen-

dicular to their elongate axis, each of said teeth having integral knife-like cutting edges defining opposite sides thereof, means supporting each bar on said first support body with its elongate axis parallel to said first central axis and with each bar on a common cylindrical arrangement with the other bars, said supporting means also supporting each bar with each tooth thereof circumferentially aligned with corresponding teeth of the remaining bars, each tooth cooperating with said corresponding teeth to define said integral cutting means for cutting an associated pair of side walls of an associated groove, a second support body, said second support body having a second central axis and comprising, a second plurality of rake-like cutting bars each having an elongate axis and each having integral spaced parallel teeth which also comprise said cutting projections and are disposed perpendicular to their elongate axis, each of said teeth of said second plurality of bars having integral knife-like cutting edges defining opposite sides thereof, and means supporting each bar of said second purality on said second body with its elongate axis parallel to said second central axis and with each bar also on a common second cylindrical arrangement with the other bars, said supporting means also supporting each bar of said second plurality on said second body with each tooth thereof circumferentially aligned with corresponding teeth of the remaining bars of said second plurality, each tooth of said second plurality of bars cooperating with said corresponding teeth of the remaining bars of said second plurality to define said integral cutting means for cutting an associated pair of side walls of an associated groove, a central support shaft, and means fixing said support bodies concentrically around and in side-by-side relation on said shaft with their central axes coaxially aligned on a common axis and with said second cylindrical arrangement cooperating with said first-named cylindrical arrangement to define an extended cylindrical arrangement, said first plurality of rake-like cutting bars being angularly displaced about said first support body with the same angular displacement therebetween, said second plurality of rake-like cutting bars are also angularly displaced about said second support body with said same angular displacement therebetween, the rake-like cutting bars of said second plurality being further angularly displaced with respect to said first cutting bars yet all cutting bars being disposed on said extended cylindrical arrangement.

4,534,688

Patent Not Issued For This Number

4,534,689

MOBILE RAIL CONTOURING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumasch Inenindustriegesellschaft m.b.H., Vienna, Austria

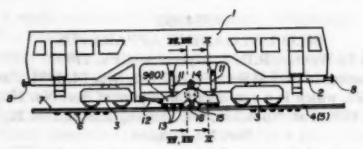
Continuation of Ser. No. 141,892, Apr. 21, 1980, abandoned. This application Jan. 31, 1983, Ser. No. 462,526

Claims priority, application Austria, Aug. 14, 1979, 5538/79

The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.

Int. Cl.³ B23D *1/20*; E01B *31/15*

U.S. Cl. 409—296 **19 Claims**



1. A mobile rail contouring machine mounted on a railroad track for continuous movement in an operating direction, the track including two rails each having a rail head defining a gage side, a field side and a running surface, the gage and field sides extending from the running surface to a lower edge of the rail head, the machine being arranged for continuously removing such running surface irregularities as ripples, corrugations and overflow metal during the continuous movement and comprising

(a) a frame running on the track on undercarriages having flanged wheels engaging the gage and field sides in a zone adjacent the running surface,

(b) a respective rail contouring tool mounting linked to the frame and associated with each rail,

(c) drive means for adjusting each mounting vertically relative to the running surface of the rail head of the associated rails and for pressing the mounting thereagainst,

(d) additional drive means for laterally pressing each mounting independently of the other mounting and without play against a selected one of the rail head sides of the associated rail,

(e) guide roller means for vertically and laterally guiding each mounting along said rail head, the guide roller means including

(1) a plurality of guide rollers engaging the running surface of said rail head and vertically guiding the mounting therealong, the guide rollers being spaced along the mounting in the operating direction and being stationary with respect to the mounting during the continuous movement, and

(2) an additional guide roller laterally guiding the mounting without play along a selected one of the sides of said rail head and engaging the selected rail head side in a region extending from the lower edge to below the zone adjacent the running surface,

(f) a rail contouring tool head including a tool holder mounted on each mounting between two of the plurality of guide rollers, and

(g) a rail contouring tool mounted in the tool holder.

4,534,690

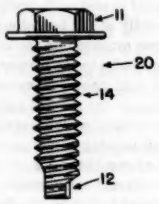
ASSYMETRICALLY SHAPED THREAD FORMING SCREW AND METHOD OF MAKING SAME

Gerald D. Barth, South Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 26, 1983, Ser. No. 545,814

Int. Cl.³ F16B *39/30*; B21K *1/56*

U.S. Cl. 411—386 **4 Claims**



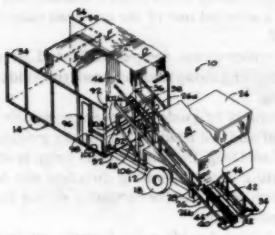
1. A thread forming fastener comprising a generally cylindrical shank with a head at one end and a tip at the other end, said tip having a generally asymmetrical cross-sectional shape with a pair of outer lead surfaces having blunt generally rounded shape, and said tip having a substantially fully formed and interrupted thread formed thereon, said tip including a pair of diametrically oppositely disposed indented inner surfaces intermediate said lead surface, one of said inner surfaces being comprised of a pair of generally flat parallel axially oriented surfaces, and one of said inner surfaces being generally arcuate and spiral in cross-section and generally parallel with said flat surfaces, said thread extending over a major portion of the length of said tip and continuing uninterruptedly at a constant pitch on at least a portion of said shank.

4,534,691

SELF-PROPELLED AGRICULTURAL VEHICLE FOR PICKING UP AND TRANSPORTING LARGE BALES OF HAY

Marvin E. Miguel, Armona, Calif., assignor to J. A. Freeman & Son, Inc., Portland, Oreg.

Filed Oct. 17, 1983, Ser. No. 542,594
Int. Cl.[3] A01D *87/12*
U.S. Cl. 414—38 4 Claims



1. An agricultural vehicle for picking up and transporting bales of hay, which comprises

a vehicle chassis and means supporting the chassis for movement over the ground,

a bale-receiving box having forward and rear ends, a floor, spaced apart lateral sides, and an entry zone at said forward end, said box being pivotally mounted on the chassis to permit tilting of the box about a horizontal axis extending transversely of the vehicle axis,

an upright wall disposed within the box extending transversely of the vehicle axis and mounted for movement in a path extending along such vehicle axis for movement from the forward to the rear end of the box,

means connected to said wall, resisting free movement of the wall rearwardly in the box along said path,

conveyor means mounted on the chassis operable to pick up and transport bales to the forward end of the box forward of said wall, said conveyor means being operable to pick up bales lying on the ground and then transport the bales, while on their sides endo therealong, the conveyor means having an off-bearing end adjacent said entry zone which is elevated above the floor of the box whereby a bale rotates over its end substantially 90° on leaving said off-bearing end and falling to the floor of the box to become positioned on its end in said entry zone of the box,

lateral pushing means for pushing a bale laterally within said box out of said entry zone into a standby zone located laterally of the entry zone within said box, such pushing of a bale freeing said entry zone for another bale, said lateral pushing means having a powered ram affixed under the floor of said box and a lateral push bar operatively connected to said ram for pushing a bale, and

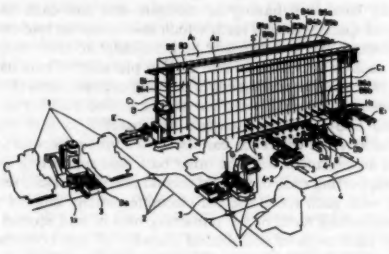
rear pushing means for pushing bales within the box and in said entry zone and said standby zone rearwardly in the box whereby to free the entry zone and the standby zone to receive other bales, with such bales pushed by said pushing means pushing against said wall and rearward movement of such bales being restrained by the means resisting free movement of the wall.

4,534,692

MATERIAL FLOW SYSTEM FOR AUTOMATIC WAREHOUSES

Tadataka Shiomi; Kouichi Nabika, both of Gifu, and Takashi Kawagoe, Shiga, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 380,776, May 21, 1982, abandoned.
This application Sep. 21, 1984, Ser. No. 654,036
Claims priority, application Japan, May 24, 1981, 56-79007
Int. Cl.[3] B65G *1/04*
U.S. Cl. 414—282 6 Claims



1. A materials flow system for an automatic warehouse serving to supply materials to and store materials from a plurality of work stations, comprising:

a pair of automatic warehouses arranged to be mutually parallel, each automatic warehouse having a plurality of housing blocks;

a first stacker crane interposed between the two automatic warehouses arranged in parallel, adapted to be capable of transferring materials to, from, and between either of said automatic warehouses;

at least one automatic trailer;

at least one delivery station, disposed adjacent said automatic warehouses and adapted to receive materials from the first stacker crane and to deliver materials to the automatic trailer, and the reverse;

a second stacker crane, disposed in front of either of said automatic warehouses, said second stacker crane having two sets of slide forks for simultaneously transferring two materials to or from a pair of side-by-side housing blocks of said automatic warehouse adjacent said second stacker crane;

at least one setting station, disposed adjacent the second stacker crane, each of said at least one setting station being capable of receiving two materials, said second stacker crane being further adapted to simultaneously transfer two materials to or from the at least one setting station;

means for transferring materials between the at least one setting area and the at least one automatic trailer; and

means for controllably guiding the at least one automatic trailer between said at least one delivery station, each of said plurality of work stations, and said at least one setting station.

4,534,693

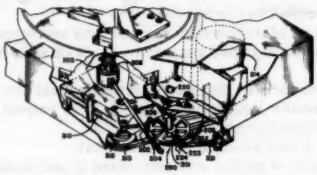
SILO UNLOADING APPARATUS

Richard L. Weaver, R.D. 4, Myerstown, Pa. 17067

Continuation-in-part of Ser. No. 302,191, Sep. 14, 1981, Pat. No. 4,432,687, which is a continuation-in-part of Ser. No. 191,071, Sep. 26, 1980, Pat. No. 4,337,364. This application Jun. 22, 1983, Ser. No. 506,666
The portion of the term of this patent subsequent to May 21, 2001, has been disclaimed.
Int. Cl.[4] B65G *65/46*
U.S. Cl. 414—307 3 Claims

1. In a silo unloader of the bottom unloader type having an unloading auger generally radially disposed at the bottom of

the silo and mounted for rotation on its own axis for intermittent arcuate sweeping movement across the floor of the silo, including an auger mount substantially at the center of the silo at about the floor level, said mount being rotationally moveable about a generally vertical axis and having a ring-like portion disposed in the silo floor and moveable therewith, including intermittent drive means for engaging said ring-like portion and driving it in a series of repeated intermittent arcuate motions, for driving the auger in a uniform intermittent sweeping motion across the silo floor, whereby materials may be delivered through a generally centrally located discharge



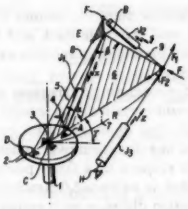
opening in the silo floor, wherein a drive shaft is provided inside said silo, and motor means is provided for driving said drive shaft in a continuous rotational motion with means operatively connecting said drive shaft and said auger for rotationally driving the auger on its own axis in a continuous rotational motion from said drive shaft, and wherein conversion means is provided in said silo at the general center thereof as part of said intermittent drive means, operatively connected to said drive shaft for converting continuous rotational motion from said drive shaft to an intermittent motion provided to said intermittent drive means.

4,534,694

MULTI-ARTICULATE ARM MECHANISM

Goro Tuda, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jan. 17, 1983, Ser. No. 458,706
Claims priority, application Japan, Jan. 18, 1982, 57-6485
Int. Cl.³ B66C *23/00*
U.S. Cl. 414—735 **7 Claims**



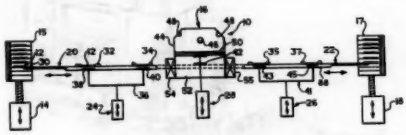
1. A multi-articulated arm mechanism, comprising:
a first base plate;
a rotary member rotatably mounted to said first base plate so as to be rotatable with respect to said first base plate about a first axis of rotation;
a first arm pivotally mounted at a first point thereof on said rotary member so as to be pivotable in a plane containing said first axis;
first positioning means for selectively changing the angle formed between said first arm and said first axis;
a second arm pivotally attached at a first point thereof to said first arm at a second point on said first arm remote from said first point of said first arm, said second arm being attached to said first arm so as to be pivotable in a plane common to both said first and second arms;
second positioning means for selectively changing the angle formed between said second arm and said first arm,
a second base plate located in a position outside said common plane; and
third positioning means pivotally mounted at a first point thereof on said second base plate, said third positioning means further comprising a slide arm pivotally connected to said second arm at a second point of said second arm remote from said first point of said second arm, wherein said third positioning means further comprises means for selectively changing the distance between said second base plate and said second point of said second arm by extending said slide arm along a straight line running between said first point of said third positioning means and said second point of said second arm.

4,534,695

WAFER TRANSPORT SYSTEM

Paul O. Stump, Byfield, and Calvin G. Taylor, Andover, both of Mass., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 23, 1983, Ser. No. 497,333
Int. Cl.³ B65G *25/00*
U.S. Cl. 414—749 **7 Claims**



1. In apparatus for processing semiconductor wafers; a wafer transport system comprising a first horizontally movable shuttle having first, second and third wafer holding elements formed thereon in equally spaced relation to one another; a first vertically movable lift mechanism underlying said first shuttle, said lift mechanism including first and second wafer engaging surfaces formed thereon and spaced apart an amount equal to the spacing between the first and second and second and third wafer holding elements; means for moving said shuttle along a linear path between a first position wherein said first and second wafer holding elements are in vertical alignment with said first and second wafer engaging surfaces and a second position wherein said second and third wafer holding elements are in vertical alignment with said first and second wafer engaging surfaces, said moving means being operable to move said shuttle at a velocity which increases gradually from zero to a maximum midway between said first and second positions and which decreases gradually to zero during the remaining travel; and means for moving said lift mechanism vertically between a first position beneath the wafer holding elements formed on said first shuttle and a second position wherein said wafer engaging surfaces are operable to lift wafers free of said wafer holding elements, said moving means being operable to move said lift mechanism at a velocity which increases gradually from zero to a maximum midway between said first and second positions and which decreases gradually to zero during the remaining travel.

4,534,696

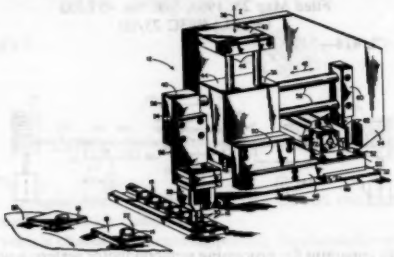
ARTICLE TRANSFER MECHANISM

Robert J. Ensminger, Winchester, Conn., assignor to The Arthur G. Russell Company, Incorporated, Bristol, Conn.

Filed May 5, 1983, Ser. No. 491,817
Int. Cl.³ B65G *47/90*
U.S. Cl. 414—751 **17 Claims**

16. A transfer tool mechanism having a tool mounting surface movable along a path extending in two coordinate direc-

tions between two spaced end stations, said transfer mechanism comprising a base, a first body supported for movement relative to said base along a first axis fixed relative to said base, a second body supported on said first body for movement relative to said first body along a second axis fixed relative to said first body and generally perpendicular to said first axis, a crank arm supported by said base for movement relative thereto about a third axis fixed relative to said base and generally perpendicular to the plane of said first and second axes, means for repeatedly driving said crank arm back and forth about said third axis through repeated cycles each including a forward stroke starting at a first angular position and ending at a second angular position and a return stroke in the opposite direction of rotation starting at said second position and ending at said first position, a first protruding member on said crank arm, means providing a pair of spaced parallel surfaces on said first body extending generally parallel to said second axis and engaging opposite sides of said first protruding member so as to move said first body along said first axis in response to rotation of said crank arm throughout the full extent of each forward stroke and each return stroke of said crank arm, a second protruding member on said crank arm, means providing a



second pair of spaced parallel surfaces on said second body, said second pair of parallel surfaces extending generally parallel to said first axis and being arranged to receive between them said second protruding member of said crank arm during an intermediate portion of each forward stroke and during a corresponding intermediate portion of each return stroke of said crank arm so as to move said second body relative to said first body along said second axis during the time said second protruding member is received between said second pair of surfaces, each of said forward and return strokes of said crank arm having end portions on opposite sides of said intermediate portion throughout which end portions said second protruding member is out of engagement with said second pair of parallel surfaces on said second body, means providing a third pair of parallel surfaces on said second body which third pair of surfaces face one another and extend generally parallel to said first axis, protruding means on said base arranged to enter between said third pair of parallel surfaces to prevent movement of said second body relative to said first body along said second axis throughout said end portions of said forward and return strokes of said crank arm, and a tool mounting surface on said second body.

4,534,697

TRANSFER DEVICE FOR ROBOTS

Jean-Pierre Poncet, Saint Ismier, France, assignor to Allibert S.A., France

Filed Jun. 13, 1983, Ser. No. 503,594

Claims priority, application France, Jun. 17, 1982, 82 10619

Int. Cl.[3] **B65C** *1/00*

U.S. Cl. 414—787 **5 Claims**

1. A telescopic transfer device for use in robots, comprising:

a support,

a first tubular member which is extendable/retractable over substantially a certain distance with respect to said support,

a second tubular member telescopically disposed within said first tubular member, and being extendable/retractable over substantially said certain distance with respect to said first tubular member,

a first set of three tracks oriented around an outer periphery of said second tubular member at approximate angles of 120° with respect to one another,

a first set of three rollers disposed on an inner periphery of said first member, with each roller engaging a respective track on said second member,

a second set of three tracks oriented around an outer periphery of said first member at approximate angles of 120° with respect to one another,

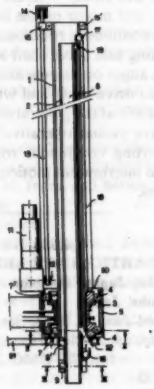
a second set of three rollers engaged with said support, with each roller engaging a respective track on said first member,

first means for extending and/or retracting said first member substantially said certain distance with respect to said support, and comprising

motor means mounted on said support,

a first pair of pulleys with one affixed to said motor means and the other mounted on said support, and

first belt means engaged with said motor means and with



said first tubular member, wound around said first pair of pulleys, and movable back and forth in a direction substantially parallel to a median axis of said first tubular member,

second means for extending/retracting said second member substantially said certain distance with respect to said first member, such that upon said first member being extended/retracted in a direction over substantially said certain distance with respect to a fixed point of reference, said second member is extended/retracted over substantially twice said certain distance with respect to the fixed point of reference,

said second extending/retracting means comprising

a second pair of pulleys, both affixed to said first tubular member, and

second belt means engaged with said second member and with said support, and wound around said second pair of pulleys,

electric and/or pneumatic control means actuatable from an extremity of said second member,

at least one flexible power supply line engaged with said control means,

at least one additional pulley situated on said first member, with said at least one power supply line passing along an interior portion of said second member substantially parallel to a median axis of said second member, around said

additional pulley, along the outer periphery of said first member, and to said support, and

means for rotating said first and second members about said respective median axes thereof, which comprises

a rotatable hub rotatably mounted with respect to said support and engaged with said second set of rollers, and

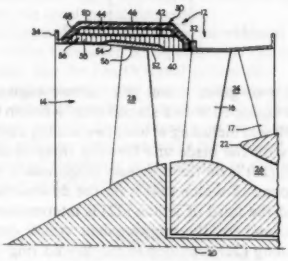
a rotatable bearing through which said first belt means is engaged with said first tubular member.

4,534,698

BLADE CONTAINMENT STRUCTURE

Michael J. Tomich, Lynnfield, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Apr. 25, 1983, Ser. No. 488,563
Int. Cl.³ F01D *21/00*
U.S. Cl. 415—9 **17 Claims**



9. A blade containment structure for surrounding blades of a gas turbine engine comprising:

an annular honeycomb structure positionable radially outwardly of the entire axially extent of blade tips of said blades and including:

a radially inner honeycomb region bounded by a septum and an inner wall spaced radially inwardly therefrom and being faceable toward said blade tips; and

a radially outer honeycomb region bounded by said septum and an outer wall spaced radially outwardly therefrom; and

a fabric containment blanket disposed radially outwardly of said outer wall of said second honeycomb region and being of a type effective for containing blade fragments thrown outwardly upon damage to said blades.

4,534,699

COAL FIRED TURBINE

Clarence P. Possell, 19867 Cajon Blvd., San Bernadino, Calif. 92407

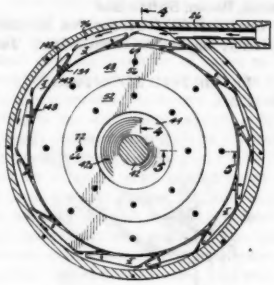
Filed Jun. 22, 1983, Ser. No. 506,785
Int. Cl.³ F01D *1/36*
U.S. Cl. 415—42 **7 Claims**

1. In combination with a source of pressurized gaseous products of combustion resulting from the burning of coal and that contains fly ash, a turbine that includes a housing that has a pair of laterally spaced side walls connected by an end wall, which end wall has an inlet therein through which a stream of said pressurized gaseous products of combustion flow to the interior of said housing; nozzle means in said interior adjacent said end wall that subdivide said gaseous products of combustion in said interior into a plurality of circumferentially spaced inwardly directed pressurized streams thereof; a centered power take off shaft that transversely spans said interior and is rotatably supported from said housing; a rotor mounted on said power take off shaft and occupying a centered position in said interior, with both of said side walls having centered outlets therein through which said gaseous products of combustion flow, said turbine being characterized by said rotor delivering rotational power to said power take off shaft to two stages, by means of "boundary layer drag" said rotor including:

a. a first circular rotor plate secured to said power output shaft and occupying a centered position in said interior;

b. a plurality of laterally spaced first ring shaped discs disposed on opposite sides of said first rotor plate in equal number within said interior, said first ring shaped discs defining a plurality of first passages of a first width therebetween;

c. a plurality of laterally spaced second ring shaped discs of substantially smaller external diameter than that of said first ring shaped discs and situated between the latter in equal number on opposite sides of said first rotor plate, said second ring shaped discs cooperating with said first ring shaped discs to define a plurality of second passages of a second width, said pressurized streams of gaseous products of combustion entering said first passages substantially tangentially thereto at a first velocity and first pressure to flow inwardly in a spiral path through said first passages to impart first stage rotational power to said power take off shaft due to the boundary layer drag imposed on said first ring shaped discs, said gaseous products of combustion exiting from said first passages at a second pressure and second velocity, said gaseous products of combustion entering said second passages at said second velocity and second pressure to thereafter flow therethrough in an inwardly directed spiral path to discharge



through said centered outlets and in so doing imparting second stage rotational power to said power take off shaft due to boundary layer drag imposed on said second ring shaped blades and portions of said first ring shaped blades adjacent thereto, with the velocity of flow of said gaseous products of combustion through said second passages being at least partially at a third velocity greater than said second velocity due to said second passages being of said second width that is substantially less than said first width, and said power take off shaft being subjected to substantially no side thrust due to said gaseous products of combustion flowing through an equal number of said first and second passages on opposite sides of said first rotor plate; and

d. first means for maintaining said first and second ring shaped discs at fixed positions relative said first circular rotor plate, with said second width being greater than the maximum overall dimension of a particle of fly ash to permit said fly ash to discharge freely through said first and second passages to said centered outlet with said first means including:

1. a plurality of first, circumferentially spaced rods supported by said first rotor plate and extending outwardly from opposite sides thereof to engage aligned openings in said first ring shaped discs;

2. a plurality of second, circumferentially spaced rods supported by said first rotor and inwardly disposed from said first rods a substantial distance, said second

rods engaging aligned openings in said first and second ring shaped discs;

3. a plurality of first tubular spacers on said first rods that are in abutting contact with said first ring shaped discs and so maintain said first ring shaped discs relative to one another that said first passages of first width are provided therebetween;

4. a plurality of second tubular spacers on said second rods that are in abutting contact with said first and second ring shaped discs and so maintain said first and second ring shaped discs relative to one another that said second passages of said second width are defined therebetween; and

5. a pair of second rotor plates of ring shape that are secured to opposite ends of said first and second rods to maintain said first and second ring shaped discs in fixed positions relative said first rotor plate.

4,534,700

EXTERNALLY MOUNTED EXHAUST-GAS TURBOCHARGER WITH UNCOOLED GAS DUCT

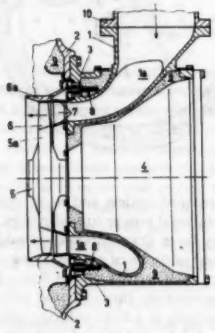
Hansulrich Hörler, Zurich, and Ambrogio Perego, Wettingen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 10, 1984, Ser. No. 569,656

Claims priority, application Switzerland, Jan. 18, 1983, 263/83

Int. Cl.³ F01D *25/26;* **F02C** *7/20*

U.S. Cl. 415—135 **4 Claims**



1. In an externally mounted exhaust gas turbocharger of the type comprising a rigid support casing, a turbine shaft, a bearing casing carrying said turbine shaft and attached to said support casing, and an uncooled gas casing defining a duct for supplying exhaust gas, said gas casing being attached to said supporting casing by connecting means which permits said gas casing to expand radially relative to said support casing, the improvement wherein said connecting means comprises an annular supporting member which is resilient in the radial direction and which includes at least two diaphragm flanks which extend predominantly in the axial direction and which are joined together on one end by a fold and are connected at the other end by respective flanges to the hot gas casing and the supporting casing, respectively, said flanges lying at least approximately in a common radial plane; the coefficient of thermal expansion of the material of the diaphragm flanks being from 5 to 40% higher than that of the material of the hot gas casing.

4,534,701

ROTOR OR GUIDE WHEEL OF A TURBINE ENGINE WITH SHROUD RING

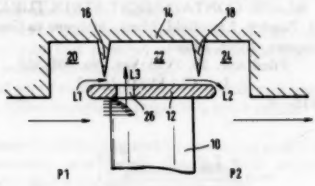
Gerhard Wisser, Grubweg 11, 7745 Schonach, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,724

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3225280

Int. Cl.³ F04D *29/68;* **F01D** *11/02*

U.S. Cl. 415—168 **5 Claims**



1. In a rotor or guide wheel of a turbine engine having a turbine blade equipped with a shroud ring, wherein the engine has a labyrinth seal including at least two sealing combs (16,18) cooperating with the blade and forming three chambers, the first of which (20) is on the upstream compression side of the blade, the second of which (24) is on the downstream side of the blade, and the third of which (22) is intermediate the first and second chambers, the improvement which comprises at least one opening (26) provided in the shroud ring (12) in the vicinity of the upstream compression side (A) of each turbine blade (10) in a region defining a source of secondary leakage flow in which the pressure drop between the blade channel and the third chamber is greatest, and substantially immediately beyond the first sealing comb (16) for connecting the blade channel with the third chamber 22 between the sealing combs (16,18) of the labyrinth seal, whereby the pressures before and after the sealing comb (16) are substantially equalized, thereby minimizing the peripheral and gap losses.

4,534,702

PNEUMATIC CONTROL VALVE ACTUATOR COMPUTER CONTROL ARRANGEMENT

Raymond G. Johnson, Jr., Orange, Conn.; Bill L. Trustee, Jamaica, N.Y., and William C. Fischer, Monroe, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1983, Ser. No. 565,668

Int. Cl.³ F01D *17/00;* **B64C** *11/18, 27/06, 19/00*

U.S. Cl. 416—20 R **3 Claims**

1. A control system for a circulation control rotor system in an aircraft comprising:

a compressed air supply;

a plenum connected to receive compressed air from the compressed air supply;

a plurality of valves distributed in a series around a circumference of the plenum for modulating the escape of air

through openings in the plenum in response to signals for controlling the aircraft, wherein one of the valves in the series is designated as the first plenum valve and the valve which is next to the first plenum valve in the series is designated as the second plenum valve and the valve which is next to the second plenum valve in the series is designated as the third valve and the valve which is next to the third plenum valve in the series is designated as the fourth plenum valve;

means for providing signals indicative of a desired control response; and

a quad-redundant flight control computer for providing the signals for controlling the airflow to the valves in response to the signals indicative of a desired control response, including a first signal processor; a second signal processor; a third signal processor; and a fourth signal processor; characterized in that:

the first plenum valve and every incremental fourth valve in the series thereafter is responsive to the first signal processor and the third signal processor;

the second plenum valve and every incremental fourth valve in the series thereafter is responsive to the second signal processor and the fourth signal processor;

the third plenum valve and every incremental fourth valve in the series thereafter is responsive to the first signal processor and the fourth signal processor; and

the fourth plenum valve and every incremental fourth valve in the series thereafter is responsive to the second signal processor and the third signal processor.

4,534,703

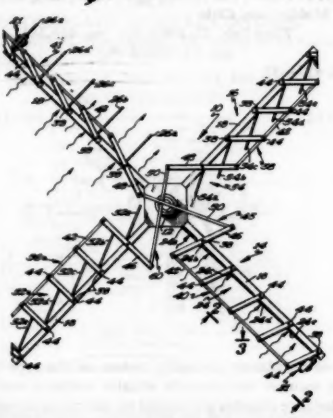
WIND POWER SYSTEM

George A. Flavell, 3425 E. 50th St., Minneapolis, Minn. 55417

Filed Aug. 30, 1983, Ser. No. 527,686

Int. Cl.[3] F03D *3/06*

U.S. Cl. 416—119 6 Claims



1. Wind power system comprising, in combination: a vertically orientated main shaft; a horizontally orientated main frame operatively attached to the main shaft; a first set of vanes, with the first set of vanes including at least a first vane; a second set of vanes, with the second set of vanes including the same number of vanes as the first set of vanes; with the vanes including at least a first wind abutment surface and means for pivotally mounting the vanes to the horizontally orientated main frame about a vertical axis generally parallel to but spaced from the main shaft, with the vanes being pivotal between a first, wind catching position and a second, wind releasing position, with the first set of vanes being located on diametrically opposite sides of the main shaft than the second set of vanes; and means for pivotally relating the first set of vanes with the second set of vanes for smoothly alternating between a first condition and a second condition as the wind power system is being rotated about the vertically oriented main shaft by the wind, with the first condition having the first set of vanes in its first position and the second set of vanes in its second position and thus allowing the wind to blow against the first wind abutment surface of the first set of vanes causing rotation of the vertically orientated main shaft and allowing the wind to pass through the second set of vanes to substantially not impede the rotation caused by the first set of vanes, and with the second condition having the first set of vanes in its second position and the second set of vanes in its first position and thus allowing the wind to blow against the second wind abutment surface of the second set of vanes causing rotation of the vertically orientated main shaft and allowing the wind to pass through the first set of vanes to substantially not impede the rotation caused by the second set of vanes, wherein the pivotally relating means comprises, in combination: a first vane set orientation pivot arm having a first end operatively attached to the first vane of the first set of vanes generally perpendicular to the vane vertical axis and having a second end; a second vane set orientation pivot arm having a first end operatively attached to the first vane of the second set of vanes generally perpendicular to the vane axis and having a second end; and a linkage arm extending between and pivotally attached about vertical axes to the second ends of the first and second vane set orientation pivot arms; a second horizontally orientated main frame operatively attached to the main shaft; a third set of vanes, with the third set of vanes including at least a first vane; a fourth set of vanes, with the fourth set of vanes including the same number of vanes as the third set of vanes; with the third set of vanes being located on the second horizontally orientated main frame on diametrically opposite sides of the main shaft than the fourth set of vanes; and means for pivotally relating the third set of vanes with the fourth set of vanes for smoothly alternating between a first condition and a second condition as the wind power system is being rotated about the vertically oriented main shaft by the wind, with the first condition having the third set of vanes in its first position and the fourth set of vanes in its second position and thus allowing the wind to blow against the first wind abutment surface of the third set of vanes causing rotation of the vertically oriented main shaft and allowing the wind to pass through the fourth set of vanes to substantially not impede the rotation caused by the third set of vanes, and with the second condition having the third set of vanes in its second position and the fourth set of vanes in its first position and thus allowing the wind to blow against the first wind abutment surface of the fourth set of vanes causing rotation of the vertically orientated main shaft and allowing the wind to pass through the third set of vanes to substantially not impede the rotation caused by the fourth set of vanes, with the pivotal position of the third and fourth sets of vanes being mechanically independent of the pivotal position of the first and second set of vanes, wherein the pivotally relating means comprises, in combination: a third vane set orientation pivot arm having a first end operatively attached to the first vane of the third set of vanes generally perpendicular to the vane vertical axis and having a second end; a fourth vane set orientation pivot arm having a first end operatively attached to the first vane of the fourth set of vanes generally perpendicular to the vane axis and having a second end; and a linkage arm extending between and pivotally attached about vertical axes to the second ends of the third and fourth vane set orientation pivot arms; wherein each set of vanes includes a plurality of vanes, and wherein the pivoting relating means further comprises, in combination: means for maintaining the plurality of vanes of each set of vanes in the same pivotal position relative to each other; and means for maintaining the plurality of vanes of each set of vanes in the same pivotal position relative to each other; wherein the means for maintaining the plurality of vanes in the same pivotal position comprises, in combination: vane orientation pivot arms having a first end operatively attached to the vane generally perpendicular to the vane vertical axis and having a second end; and an elongated member, with the second ends of the

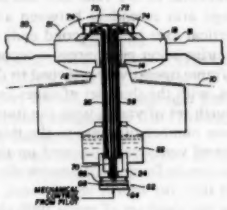
vane orientation pivot arms of each of the vanes in the set of vanes being pivotally attached to the elongated member such that the vane orientation pivot arms of each of the vanes are parallel to each other; and wherein the vane set orientation pivot arms are formed by the continuation of the vane orientation pivot arms extending beyond the vane pivot axis; wherein the vane set orientation pivot arms are formed by the continuation of the vane orientation pivot arms extending beyond the vane pivot axis; and wherein the pivotal position of the third and fourth sets of vanes are mechanically independent of the pivotal position of the first and second set of vanes.

4,534,704

HELICOPTER ROTOR CONTROL SYSTEM WITH INTEGRATED HUB

Francis H. McArdle, Norristown, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 8, 1983, Ser. No. 464,810
Int. Cl.³ B64C *27/72*
U.S. Cl. 416—158 **17 Claims**



1. A rotor control system for a helicopter, comprising:
a rotor hub having a plurality of rotor blade attaching arms, each arm defining a longitudinal axis, which axes intersect at the center of the rotor hub;
actuator means mounted to each blade attaching arm; and
means for producing rotation of each actuator means independently of its respective attaching arm and relative to the longitudinal axis of its respective attaching arm, wherein each actuator means comprises a hydraulic actuator, wherein the means for producing rotation of each actuator means comprises a hydraulic circuit including a pump, a hydraulic line for each actuator connected to the pump and to a respective actuator, and control means for controlling the flow of hydraulic fluid through the hydraulic lines, and wherein the control means are mounted in the rotor hub.

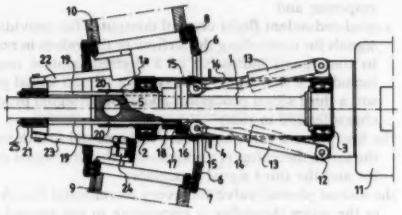
4,534,705

HORIZONTAL-SHAFT WIND TURBINE WITH FEW BLADES

Rune K. Selestam, P.O. Box 2947 b, Kungsbacka, and Ingemar K. Nygren, Kevingeringen 21, Danderyd, both of Sweden

Filed Jan. 21, 1983, Ser. No. 460,025
Int. Cl.³ F03D *7/02*
U.S. Cl. 416—162 **3 Claims**

1. In a horizontal shaft wind turbine with few blades, and including a shaft driven by said blades at high speed, a tubular housing having first and second bearings disposed at opposite ends thereof supporting said shaft, and a device for rotating the turbine blades about their chief axes, comprising:
(a) actuation means located within said housing, between said first and second bearings, enclosing part of said shaft and axially displaceably mounted thereon, said actuation means having first and second halves, said first half secured against rotation on said shaft and said second half rotatable with respect to said shaft;
(b) a power source fixedly disposed outside the turbine shaft and coupled to said second half;
(c) bearing means interconnecting said first and second halves axially while permitting rotational movement therebetween whereby said power source can move said second half to impart axial motion to said actuation means;
(d) a diametrically enlarged portion at said shaft for carrying said first bearing;
(e) a collar axially displaceable on said shaft outside said housing;
(f) links connecting said collar to said turbine blades;



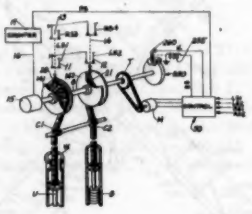
(g) rods coupled between said first half of said actuation means and said collar to transfer the axial motion to said collar; and
(h) said diametrically enlarged shaft portion carrying said first bearing located between said collar and said actuation means having formed therein axial bores, said rods passing through said bores.

4,534,706

SELF-COMPENSATING OSCILLATORY PUMP CONTROL

Richard R. Palm, Fullerton; Robert G. James, Whittier, and Robert E. Fisher, Los Nietos, all of Calif., assignors to Armco Inc., Middletown, Ohio

Filed Feb. 22, 1983, Ser. No. 468,341
Int. Cl.³ F04B *49/00*
U.S. Cl. 417—17 **23 Claims**



1. In an oscillatory pumping system of the type having a pumping member reciprocably slidable within a well bore, a counterbalance member connected to said pump member for at least partially counterbalancing the weight of the pump member to affect an oscillatory action, means for reciprocating said pumping member in upward and downward stroke directions comprising a pump cycle wherein the pump member is moved cyclically in an upward direction to a top stroke position and in a downward direction to a bottom stroke position, and a reversible electric motor for operating said reciprocating means, the improvement in combination therewith comprising control system means for applying power to and removing power from the motor at optimally determined points during the pumping cycle so as to minimize motor peak load current requirements including:
sensing means for establishing at one or more points during the pumping cycle and for a plurality of cycles, values representative of pump member movement;
means for continually calculating from said established val-

ues a first reference position in said pump cycle including means for applying power to the motor when the pump member reaches said first position and is moving in the upward direction at a point following pump member reversal at the bottom of its stroke so as to smoothly accelerate the motor to synchronous speed and to continue pump member movement in the upward direction;

first means for removing power from the motor before the pumping member reaches the top of its stroke so that the pump member reverses direction and begins moving in the downward direction;

means for continually calculating from said established values, a second reference position in said pump cycle including means for applying power to the motor when the pumping member reaches said second position and is moving in a downward direction at a point following pump member reversal at the top of its stroke so as to smoothly accelerate the motor to synchronous speed and to continue pump member movement in the downward direction; and

second means for removing power from the motor before the pumping member reaches the bottom of its stroke so that the pump member reverses direction and begins moving in the upward direction, said first and second calculated reference positions being chosen so as to minimize the motor peak load current when power is applied to the motor.

4,534,707

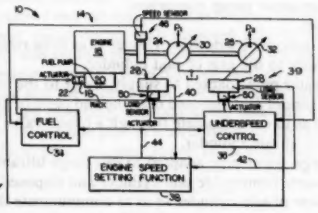
HYDROSTATIC VEHICLE CONTROL

Randall M. Mitchell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 14, 1984, Ser. No. 609,675

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—34 **13 Claims**



1. An apparatus for controlling an internal combustion engine having a rack for controlling a fuel injection pump, and at least one variable displacement hydraulic pump, the apparatus comprising:

first means for delivering a first signal responsive to the hydraulic flow demanded of said variable displacement hydraulic pump;

control means for receiving said first signal and delivering a desired engine speed signal responsive to the magnitude of said first signal;

fuel control means for receiving said desired engine speed signal and delivering a signal responsive to the magnitude of said desired engine speed signal; and,

rack actuator means for receiving said signal and controlling the supply of fuel to said engine responsive to the magnitude of said signal.

4,534,708

GETTER SORPTION PUMP WITH HEAT ACCUMULATOR FOR HIGH-VACUUM AND GAS DISCHARGE SYSTEMS

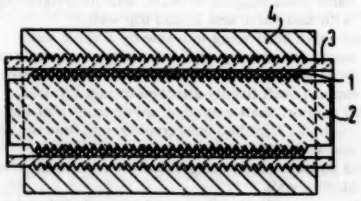
Heinz Mägdefessel, Haslach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 7, 1984, Ser. No. 638,496

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332660

Int. Cl.³ F04B *37/04*

U.S. Cl. 417—51 **6 Claims**



1. In a getter sorption pump for high-vacuum and gas discharge systems having at least one getter member of non-evaporating getter material and a corresponding heating element, the improvement comprising:

the element being attached to a sintered ceramic body; and

an insulating tube onto which the getter member is sintered externally thereto, said heating element and sintered ceramic body being located within the insulating tube.

4,534,709

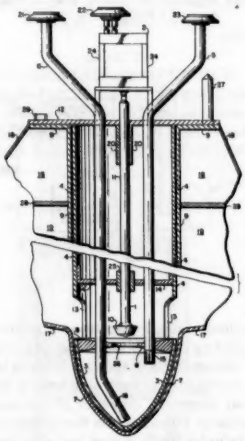
WATER DISPLACEMENT MERCURY PUMP

Marshall G. Nielsen, Woodside, Calif., assignor to United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 20, 1984, Ser. No. 602,243

Int. Cl.³ F04F *11/00*

U.S. Cl. 417—65 **4 Claims**



1. A pump for displacing a heavier fluid by a lighter fluid, comprising:

a heavier fluid;

a lighter fluid;

a process vessel adapted to receive a cannister;

a cannister adapted to receive fluid under pressure and further adapted to be received within a process vessel;

said cannister having a top wall;

said top wall having an opening therein which is adapted to

serve as a valve seat and which is further adapted to permit passage of fluid therethrough;

a fluid inlet conduit which extends through said top wall and which is fixedly attached thereto along an outer peripheral portion of said fluid inlet conduit such that a leak resistant barrier is formed between the outer periphery of said fluid inlet conduit and said top wall;

a fluid outlet conduit passing through said top wall and being fixedly secure along the outer periphery of said fluid outlet conduit to said top wall such that a pressurized barrier is formed between the outer periphery of said fluid outlet conduit and said top wall;

a valve head adapted to move into fluid-tight engagement with said valve seat in said top wall;

said valve head being movable by a valve stem;

a means for moving said valve stem to operate said valve head selectively into engagement with said valve seat; and

a support shaft fixedly attached to said top wall;

said support shaft extending away from said top wall and enclosing said fluid inlet conduit, said fluid outlet conduit, and said valve stem;

said support shaft being fixedly attached to a pump top closure wall;

whereby said lighter fluid can be introduced under pressure into said cannister through said fluid inlet conduit with sufficient pressure to displace said heavier fluid from said cannister through said fluid outlet conduit and above said top wall of said cannister, when said valve head is seated in said valve seat; and

whereby said cannister, said fluid inlet conduit, said fluid outlet conduit, said valve stem, and said valve head are removable from said process vessel by movement of said support shaft out of said process vessel.

4,534,710

SWASH-PLATE-TYPE COMPRESSOR HAVING SUCTION AND DISCHARGE DAMPING CHAMBERS

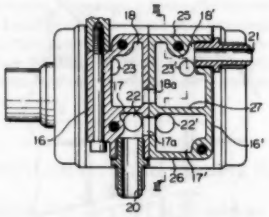
Takeshi Higuchi, Toyota; Yoshio Itakura, and Hidekazu Iwamori, both of Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Feb. 23, 1984, Ser. No. 583,101

Claims priority, application Japan, Mar. 2, 1983, 58-29993[U]

Int. Cl.³ F04B *1/16, 21/00*

U.S. Cl. 417—269 **8 Claims**



1. A multi-cylinder swash-plate-type compressor provided with axially extending cylinder block means having a generally circular outer circumference thereof from which mounting bracket means outwardly extend and have a length substantially equal to an outermost diameter of the compressor, and suction and discharge pipes held on the circular outer circumference of the cylinder block means and also having therein a swash-plate-operated reciprocative piston mechanism for sucking, compressing, and discharging a gas, housing means arranged so as to close axial ends of the cylinder block means and having therein suction and discharge chambers in communication with the reciprocative piston mechanism, and suction and discharge ports formed in a part of the outer circumference of the cylinder block means in communication with the suction and discharge chambers and with the suction and discharge pipes, wherein an improvement comprises damping means arranged between said suction and discharge ports of said cylinder block means and said suction and discharge pipes for suppressing pulsation in suction and discharge pressure of said gas, said damping means comprising extension means including a plurality of walls extending outward from said circular outer circumference of said cylinder block means and two of said walls being spaced apart a length substantially equal to the length of said mounting bracket means and said extension means cooperating with said mounting bracket means so as to define suction and discharge damping chambers having considerable volumes and cross-sectional areas larger than those of said suction and discharge pipes, respectively.

4,534,711

APPARATUS FOR PRODUCING ULTRAHIGH PRESSURE WATER JET

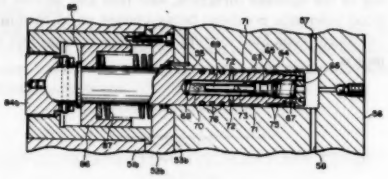
Masakatsu Wakatsuki, Ota, Japan, assignor to Wakatsuki Kikai Kabushiki Kaisha, Gunma, Japan

Filed Oct. 17, 1983, Ser. No. 542,810

Claims priority, application Japan, Jul. 1, 1983, 58-103124[U]; Aug. 8, 1983, 58-123085[U]

Int. Cl.³ F04B *1/04, 27/04;* **F01B** *31/14, 31/10*

U.S. Cl. 417—273 **3 Claims**



1. An ultrahigh pressure water apparatus, provided with a drive source for a pump, an ultrahigh pressure pump driven by said drive source and adapted to receive feed water, impart increased pressure to said feed water, and discharge said water at increased pressure, and a nozzle gun adapted to receive ultrahigh pressure water emanating from said ultrahigh pressure pump and project said ultrahigh pressure water in the form of beams, which apparatus is characterized in that said ultrahigh pressure pump comprises:

a cylinder,

a piston disposed inside said cylinder so as to be reciprocated parallelly to the axis of said cylinder,

a feed water pipe adapted to supply water to the interior of said cylinder and disposed near the end plate of said cylinder so as to communicate through a check valve with the interior of said cylinder,

a discharge water pipe adapted to discharge ultrahigh pressure water from inside said cylinder and disposed near the end plate of said cylinder so as to communicate through a check valve with the interior of said cylinder,

a piston hole formed in the surface of said piston opposed to said end plate in the axial direction of said piston substantially at the axial position thereof,

a free piston rotatably disposed inside said piston hole parallelly with the axis thereof,

an oil collecting recess formed annularly on the peripheral surface of said piston and adapted to communicate with said piston hole,

a first O-ring fitted around the peripheral surface of said free piston,

a second O-ring fitted around the peripheral surface of said piston on said end plate side of said oil collecting recess,

a piston ring interposed between said piston and said cylinder on the side opposite said end plate of said oil collecting recess, and

lubricating oil filling said oil collecting recess and said piston hole.

4,534,712

LIQUID METAL MECHANICAL PUMP EQUIPPED WITH EMERGENCY SYPHON

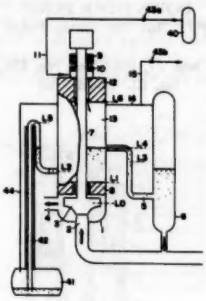
Mitsuru Kanbe, Yokohama, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 479,078

Claims priority, application Japan, Mar. 30, 1982, 57-45068[U]

Int. Cl.[3] F04B *39/06;* F01D *25/16*

U.S. Cl. 417—366 3 Claims



1. A mechanical pump means for liquid metal, comprising:

a pump casing having a lower hydrostatic bearing near the lower end thereof, an upper mechanical bearing at the upper end thereof, and a shield plug between said mechanical bearing and said casing and sealing the upper end of said casing and having the lower surface thereof exposed in said casing and defining with said hydrostatic bearing an overflow chamber in said casing, said overflow chamber normally having a liquid metal therein with a free surface and the remainder of said overflow chamber above said free surface being a cover gas space;

a drive shaft extending through said pump casing and rotatably supported in said bearings;

an overflow pipe connected to said pump casing at a level between the lower hydrostatic bearing and the upper mechanical bearing;

an emergency syphon system comprising a syphon pipe and a liquid metal dump tank disposed outside said pump casing, said syphon pipe having a shorter leg opening into said pump casing at a level between said lower hydrostatic bearing and the lever of said overflow pipe and having a longer leg emptying into said dump tank and having the top of the syphon pipe at a level between the level of said overflow pipe and said lower surface of said shielding plug.

4,534,713

PUMP APPARATUS

William F. Wanner, 5805 View La., Minneapolis, Minn. 55436

Filed Aug. 10, 1984, Ser. No. 639,911

Int. Cl.[3] F04B *17/00*

U.S. Cl. 417—377 11 Claims

1. Apparatus for filtering a liquid, comprising:

a pump having a reciprocable rod and plunger, said pump having a space separated into driving and pumping chambers by said plunger, said driving chamber having a first end closure, said rod extending from said plunger through said first end closure, said pump being in fluid communication with polluted liquid from a liquid source;

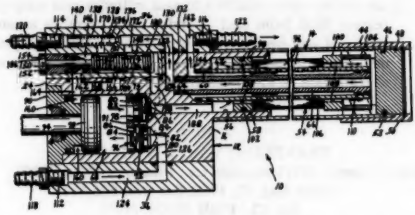
means, attached to said rod, for driving said pump;

means for filtering purified liquid and unfiltered concentrate liquid fractions from the polluted liquid;

first means for communicating the polluted liquid from the pumping chamber of said pump to said filtering means;

second means for communicating the purified liquid fr said filtering means to an outlet port;

third means for communicating unfiltered concer liquid from said filtering means to a vent port, said third communicating means including valve means for selectively directing concentrate liquid along one of a first path from said filtering means to the drive chamber of said pump and a second path from the drive chamber to said vent port, said valve means including a movable shuttle and stem, said valve means further having a passage in which said shuttle moves between a first position for directing the concentrate liquid along the first path and a second position for directing the concentrate liquid along the second path



said passage having a second end closure, said stem extending from said shuttle through said second end closure, said shuttle having a stem end and an end opposite, said rod, said plunger, said stem and said shuttle having cross-sectional areas normal to directional movements so that relative displacement volumes through which said rod, said plunger, said stem and said shuttle move on opposite sides of said shuttle and on opposite sides of said plunger are the same;

third means for communicating from said driving chamber to the stem end of the shuttle; and

fourth means for communicating from said pumping chamber to the end opposite the stem of said shuttle.

4,534,714

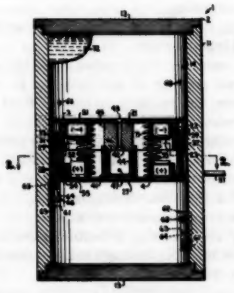
FLUID OPERATING DEVICE

Raymond H. Smith, Rte. 2 - 5AAA, Larned, Kans. 67550

Continuation-in-part of Ser. No. 466,667, Feb. 15, 1983, abandoned. This application Aug. 3, 1984, Ser. No. 637,520

Int. Cl.[3] F04B *7/04, 17/04;* F16K *31/08;* H02K *33/10*

U.S. Cl. 417—416 19 Claims



1. A fluid operating device, which comprises:

(a) a cylinder including a cylinder bore;

(b) a piston slidably movable in said cylinder bore;

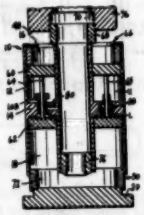
(c) a first electromagnet mounted on said piston;

(d) a second electromagnet positioned in said cylinder bore in opposed relation to said first electromagnet;
(e) mounting means for mounting said second electromagnet in said cylinder bore;
(f) said piston being adapted to move from a retracted position to an extended position upon energization of said electromagnets by a magnetic repulsion therebetween;
(g) a spring connected to said piston and said mounting means, said spring being adapted for returning said piston to its retracted position upon deenergization of said electromagnets;
(h) an inlet valve attached to said cylinder and adapted to admit fluid to said cylinder bore upon a retraction stroke of said piston, said inlet valve including a permanent magnet member adapted for opening said valve upon deenergization of said electromagnets; and
(i) an outlet valve attached to said cylinder and adapted to release fluid from said cylinder bore upon an extension stroke of said piston, said outlet valve including a permanent magnet member adapted for opening said valve upon energization of said electromagnets.

4,534,715
TRAVELING VALVE ASSEMBLY
Roy C. Jones, 28111 Autumn La., Pinehurst, Tex. 77362
Filed Aug. 17, 1983, Ser. No. 523,844
Int. Cl.³ F04B *39/08, 21/04*
U.S. Cl. 417—456 **24 Claims**

1. A traveling valve assembly adapted for connection in a pump housing, comprising
a tubular housing having a normal vertical orientation with open top and bottom ends,
a longitudinally movable check valve assembly positioned in the bottom end portion of said housing to receive fluid entering therein, and opening on flow of fluid upward and closing on cessation of upward flow of fluid,
said housing having a valve port in an upper portion thereof,
a rotary valve member positioned in operative engagement with said valve port and rotatable relative to said housing between a first position closing said valve port and a second position opening said valve port,
a longitudinally reciprocally movable member extending from said valve member through said tubular housing and out of the top end thereof,
means securing said reciprocally movable member against rotation in relation to said housing while permitting longitudinal movement,
mechanical linkage means interconnecting said reciprocally movable member and said valve member operable to convert longitudinal reciprocal movement of said movable member to rotary movement of said valve member relative to said housing,
whereby movement of said movable member a predetermined distance in one direction rotates said rotary valve member to said first position and thereafter movement of said movable member a predetermined distance in the other direction rotates said rotary valve member to said second position.

4,534,716
DOWN HOLE PUMP
James B. Tichy, P.O. Box 746 Waldo Point, Sausalito, Calif. 94965
Filed Sep. 27, 1983, Ser. No. 536,917
Int. Cl.³ F04B *9/08*
U.S. Cl. 417—469 **4 Claims**



1. A pump comprising:
an elongate cylinder which is open at each end;
a partition attached to the cylinder and dividing said cylinder into approximately equal halves;
an outlet tube axially aligned with the cylinder at its center and defining a fluid path through the partition;
an upper end plate spaced-apart from one end of the cylinder and the return tube, said upper end plate having an outlet passage substantially aligned with the return tube;
a lower end plate spaced apart from the other ends of the cylinder and return tube;
upper and lower pistons mounted to reciprocate within the cylinder on either side of the partition, said pistons being attached to each other to move in unison;
means for reciprocating the pistons; and
means for alternately sealing (1) the cylinder against the upper end plate and the return tube against the lower end plate, or (2) the cylinder against the lower end plate and the return tube against the upper end plate, whereby the reciprocation of the piston will alternately (1) draw fluid into the lower half of the cylinder and discharge fluid from the upper half into the outlet passage, or (2) draw fluid into the upper half of the cylinder and discharge fluid from the lower half of the cylinder and into the outlet passage through the return tube.

4,534,717
FLUSHABLE METERING PUMP
Bernard J. McCabe, Wyandotte, and David T. Courtney, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Continuation of Ser. No. 260,221, May 1, 1981, abandoned. This application Apr. 18, 1984, Ser. No. 601,110
Int. Cl.³ F04C *2/18, 13/00;* **B05B** *15/02*
U.S. Cl. 418—181 **4 Claims**

1. A flushable, positive displacement, gear-type metering pump assembly comprising;
(A) a pump housing;
(B) inlet and outlet chambers within said pump housing;
(C) gear means comprising two cylindrical gears disposed within said pump housing, being rotatable such that gear faces thereof mesh and form a seal which separates said

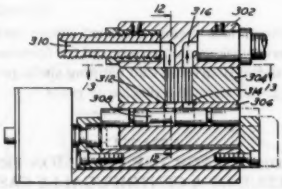
inlet and outlet chambers, and being capable of carrying metered amounts of fluid between said gear faces and the wall of said pump housing from said inlet chamber to said outlet chamber;

(D) means for driving said gear means:

(E) channel means for conveying fluid into said inlet chamber and directing said fluid against said gear faces exposed to said inlet chamber;

(F) channel means for conveying fluid from said inlet chamber to valve means;

(G) channel means for conveying fluid from said valve means to said outlet chamber, said channel means being disposed such that fluid passing therethrough into said outlet chamber is directed against said gear faces in a direction substantially parallel to the axes of said gears from a location substantially near one end of said axes;



(H) valve means which may be (i) in a closed mode when said metering pump assembly is in a metering mode such that fluid may pass from said inlet chamber to said outlet chamber only by being carried between said gear faces and said wall of said pump housing and (ii) in an open mode when said metering pump assembly is in a flushing mode such that pressurized fluid may pass from said inlet chamber to said outlet chamber not only between said gear faces and said wall of said pump housing, but also through said channel means (F), said valve means, and channel means (G); and

(I) channel means for conveying fluid from said outlet chamber and out of said metering pump assembly, all of said channel means (E), (F), (G) and (I) at the ends of said gear faces being sustantially parallel to the axes of said gears.

4,534,718

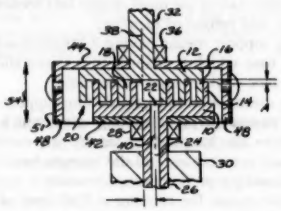
POSITIVE DISPLACEMENT SCROLL APPARATUS WITH BAND LINKING SCROLLS

Edward S. Blain, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 5, 1984, Ser. No. 627,968

Int. Cl.³ F01C 1/04, 17/00

U.S. Cl. 418—55 **10 Claims**



1. A positive displacement apparatus comprising:

first and second scrolls having interfitting vanes adapted to define at least one fluid receiving pocket movable between an inlet and an outlet;

means for causing the vane on one of said scrolls to move in an orbital path relative to the vane on the other scroll such that said pocket moves between said inlet and outlet; and

means coupling said scrolls together to prevent substantial relative angular movement therebetween allowing said orbital movement including a flexible, ring-like band interconnecting said scrolls.

4,534,719

VOLUMETRIC SCREW-AND-PINION MACHINE AND A METHOD FOR USING THE SAME

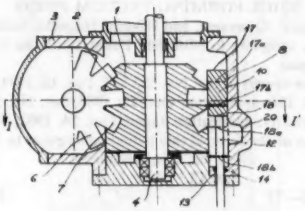
Bernard Zimmern, 27, rue Delabordère, 92200 Neuilly sur Seine, France

Filed May 9, 1983, Ser. No. 492,637

Claims priority, application France, May 13, 1982, 82 08324

Int. Cl.³ F04C 2/00, 18/00

U.S. Cl. 418—195 **11 Claims**



1. A volumetric screw-and-pinion machine such as a compressor or an expansion machine comprising, in a combination, a screw having a cylindrical outer profile, provided with several threads and rotatably mounted inside a stationary casing, at least one pinion-wheel meshing with the screw, and a slide displaceably mounted near the pinion-wheel in a channel made in the casing parallel to the axis of the screw, the slide comprising a body located in the channel and having a concave face which matches with the cylindrical outer profile of the screw and two end-edges, one of which is on a low pressure side of the body and the other of which is on a high pressure side of the body, a stationary high pressure port being provided in the casing between the pinion-wheel and the channel, wherein the slide is movable between two conditions i.e. a first condition including a series of full load positions in which the slide body uncovers in the casing beyond the high pressure edge a high pressure portion of said channel, while the slide body, said high pressure portion of said channel and the stationary port are together substantially covering the threads of the screw which are in mesh with the pinion-wheel, and a second condition in which the slide body substantially obturates said high pressure portion of said channel and, remote from the high pressure edge, uncovers a low pressure portion of said channel extending over at least part of the threads which are in mesh with the pinion-wheel teeth, wherein in at least the first of said conditions, the slide is displaceable to vary the extent of the uncovered portion of said channel while maintaining obturation of the other portion of said channel.

4,534,720

APPARATUS FOR THE PREPARATION OF BONDING FIBERS FROM POLYMER DISPERSIONS

Richard Büng; Karl Gans; Gerold Schreyer, all of Ludwigshafen, and Gerhard Welzel, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 20, 1982, Ser. No. 400,045

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128873

Int. Cl.³ B22F 9/00

U.S. Cl. 425—7 **3 Claims**

1. Apparatus for the preparation of bonding fibers, especially for the production of nonwoven materials by a wet-lay process, comprising means for combining a polymer dispersion, containing an anionic or nonionic dispersant, and an aqueous

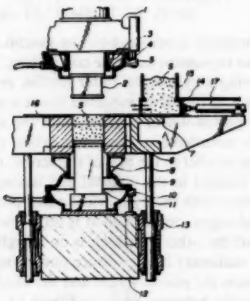
solution, containing a dissolved cationic precipitant and causing fiber formation from precipitated polymer particles, which apparatus comprises: a feed funnel for maintaining a column of liquid, a nozzle for introducing the polymer dispersion into said feed funnel and a metering device for the precipitant, which are aimed at an angle into the feed funnel, and a homogenization chamber connected to the feed funnel via a gap, and thence to a discharge chamber having a discharge port, whereby a vortex is produced in the said funnel and a dispersion thread of polymer forms therein and is broken into fiber lengths as the liquid and thread flow from the funnel to said homogenization chamber.

4,534,721

BRICK-FORMING VACUUM PRESS

Shigeo Iwasaki, Okayama, and Hiroshi Haguchi, Saidaiji, both of Japan, assignors to Mitsuishi Fukai Tekkosho Ltd., Okayama, Japan

Continuation-in-part of Ser. No. 333,821, Dec. 16, 1981, Pat. No. 4,417,864. This application Oct. 12, 1983, Ser. No. 541,172
Claims priority, application Japan, Oct. 14, 1982, 57-180197
The portion of the term of this patent subsequent to Nov. 29, 2000, has been disclaimed.
Int. Cl.³ B30B *11/02*
U.S. Cl. 425—73 **12 Claims**



1. A vacuum press for forming brick compacts, comprising,
a die, a top plunger and a bottom plunger all disposed on a common vertical central axis,
upper and lower vacuum chamber means for enclosing upper and lower spaces which surround the top and bottom plungers and extend to the die,
at least one of said vacuum chamber means including a sealing flange and a flexible bowl-like skirt, said sealing flange being connected to said flexible skirt.

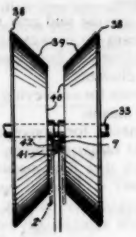
4,534,722

FORMING AND CONVEYING OF BAKED CONFECTION SHELLS

Thomas H. Lutsey, and Vernon L. Bero, both of Green Bay, Wis., assignors to Gold Bond Ice Cream, Inc., Green Bay, Wis.

Filed Apr. 16, 1984, Ser. No. 600,764
Int. Cl.³ A21C *9/00, 15/02*
U.S. Cl. 425—104 **19 Claims**

1. An apparatus for forming and conveying hot baked shells for use in confections, comprising, in combination:
(a) pick-up means for receiving a plurality of hot baked relatively soft confection discs in successions and for feeding said discs in a longitudinal direction,
(b) rotary forming means disposed downstream of said pick-up means for receiving said discs therefrom and for forming said hot baked discs into lap folded taco-shaped shells having generally parallel spaced legs joined by a folded portion,
(c) an elongated fixed conveyor rail extending downstream from said forming means for receiving said shells therefrom so that said shells hang from said rail,



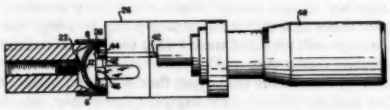
(d) and driven belt means disposed above and generally coextensive with said conveyor rail for frictionally engaging and slidingly driving said hanging shells progressively along said rail toward a discharge point.

4,534,723

CUTTING DEVICE FOR THE PRECISION TRIMMING OF THE EDGE OF A CENTRIFUGALLY CAST LENS

Michael A. Dillon, Rockaway Point, and David L. Rawlings, Bayville, both of N.Y., assignors to International Hydron Corporation, Woodbury, N.Y.

Filed Jan. 30, 1984, Ser. No. 575,250
Int. Cl.³ B29C *17/08, 25/00*
U.S. Cl. 425—289 **8 Claims**



1. A cutting device for trimming a selected peripheral edge segment of a lens secured within a mold, said mold having a flange with an annular face disposed normal to the axis of the mold and said annular face defining a cavity, said cavity having a base into which the lens is secured and the exposed outer surface of the base disposed within a peripheral skirt extended from one end of the mold; said cutting device comprising:
(a) securing means adapted to be disposed and secured within the extended skirt of the mold, said securing means having a centrally disposed projected member adapted to abut the outer surface of the base of the cavity at the longitudinal axis of the mold so that said secured mold can pivot on said projected member;
(b) cutting support means having a longitudinal axis and a support base which is adapted to seat and slide upon the annular face of the flange of the mold;
(c) cutting means secured to the cutting support means, said cutting means having a cutting edge which is radially offset from the longitudinal axis of the cutting support means and projects beyond the support base of said support means by a predetermined amount;
(d) rotatable means for rotating at least one of the means selected from the group consisting of the securing means and the cutting support means; and
(e) means for permitting relative movement between the securing means and the cutting support means from a first position where said support base of the cutting support means is axially aligned with and spaced apart from the face of the flange of the mold such that the cutting edge is disposed adjacent at least a peripheral edge segment of the lens, to a second position in which the cutting edge contacts said at least peripheral edge segment of the lens

to remove a portion of the lens until said support base of the cutting support means contacts and slides on the annular face of the flange of the mold so as to insure proper alignment of the mold with the cutting edge and thereby impart a precision trimming of the peripheral edge segment of the lens.

4,534,724

APPARATUS FOR PRODUCING PROFILED STRANDS

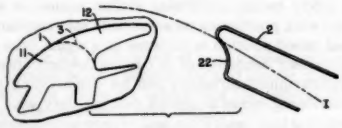
Rolf Fischer, Hanover, and Dietmar Hermann, Garbsen, both of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,366

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224906

Int. Cl.³ B29C *17/14*

U.S. Cl. 425—295 **1 Claim**



1. An apparatus for producing, with an extruder having an inlet and a nozzle opening, a profiled strand which is made of elastomeric material, said strand produced in practically infinite lengths having a curved outer contour and being provided with sealing lips along some of the portions of the curved outer contour thereof; said apparatus including in combination therewith a cutting knife which is arranged after said nozzle opening when viewed in the direction of extrusion, said cutting knife being movable transverse to the longitudinal direction of said profiled strand such that said cutting knife also can be advanced over the cross section of said sealing lips; said cutting knife having a curved shape which conforms to the adjacent outer contour of said profiled strand which is cut by said cutting knife pursuant to a prescribed pattern in such a way as to vary cross-sectional shape and to remove portions of the sealing lip from the profiled strand while the elastomeric material is still predominantly unpolymerized in the plastic state for reprocessing thereof, said cutting knife being formed by a relatively narrow high-strength metal band of steel drawn back and bent into itself over a curvature which conforms to the outer contour of said profiled strand still predominantly unpolymerized to avoid drawbacks of time-consuming and uneconomical mechanical cutting of unusable polymerized elastomeric material, said cutting knife being pivotable over a curved line up to a limiting line to cut off a cross-sectional portion that emerges from the sealing lip and means to return this cut-off cross-sectional portion to the inlet of the extruder for reprocessing of the elastomeric material which is still predominantly unpolymerized in the plastic state.

4,534,725

APPARATUS FOR MANUFACTURING OVENABLE PAPERBOARD ARTICLES

Donald J. Hemmelgarn, Minster, and Arthur L. Grow, Versailles, both of Ohio, assignors to International Paper Company, New York, N.Y.

Filed Apr. 1, 1982, Ser. No. 364,305

Int. Cl.³ B29C *17/00*

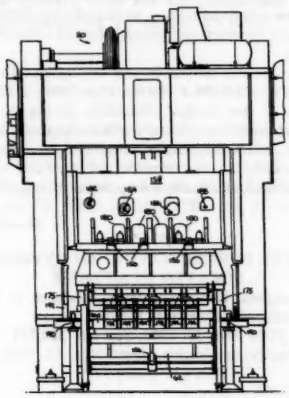
U.S. Cl. 425—394 **19 Claims**

1. A system for forming a web material into a finished product of a desired shape, said system comprising:

first and second dies for cooperating to press a blank between them to form the blank;

reciprocating means for reciprocating said first die along a reciprocation path having a first portion in which said first die is out of contact with said blank and said second die, a second portion in which said first die is in contact with said blank and in partial operative engagement with said second die, and a third portion in which said first die is in full operative engagement with said second die with said blank between said dies; and

reciprocating support means for said second die for reciprocating said second die along with said first die while maintaining said second die in full operative engagement with said first die, with a blank between said dies, while said reciprocating means for said first die is moving said first die along said third portion of the reciprocation path of said first die, for maintaining the blank in dwell between said dies with sufficient pressure for forming, while said dies move along said third portion of said reciprocation path.



4,534,726

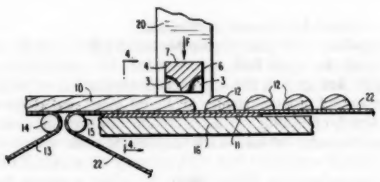
APPARATUS HAVING SHIMS UNDERLYING PORTIONS OF A DIE

William J. Simelunas, Glen Rock, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Oct. 11, 1983, Ser. No. 540,983

Int. Cl.³ A21C *5/00, 11/10*; B29C *17/08*

U.S. Cl. 425—363 **29 Claims**



1. An apparatus for producing separate pieces from an extrudate rope, comprising:

a die having a generally flat lower surface;

a means for driving the die in a cyclic operation having an upstroke and a downstroke, in which, at some point in the cycle, the die travels with a downward velocity as well as a forward velocity;

a means for conveying an extrudate rope under said generally flat surface of said die said forward velocity being in the direction of conveyor movement;

and shims underlying predetermined portions of said die;

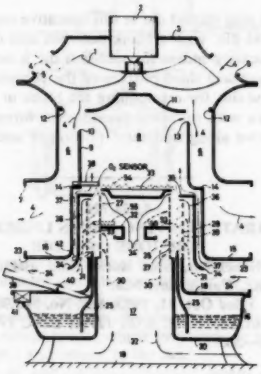
said means for conveying overlying said shims;
and a support underlying said means for conveying and said shims;
said die having opposed pairs of indentations formed therein;
said indentations opening into said lower surface of said die;
said opposing pairs of indentations lying generally in a straight line along a forward direction of travel of the extrudate rope;
and said shims underlie predetermined portions of said die between said indentations, so that during the downstroke, extrudate between said shims is forced toward said indentations;
whereby, the die moves downward against the extrudate rope to separate the extrudate rope into pieces, the lower surface of the die and the shims having dough forced therebetween toward areas where no shims are present, thereby minimizing scrap loss; and whereby during a downstroke, the die forms a trailing edge of a leading piece as well as a leading edge of a trailing piece.

4,534,727

LIQUID FUEL BURNER HAVING AN OXYGEN SENSOR LOCATED IN A FLAME

Mitsuhiro Imajima, Koriyama, Japan, assignor to Matsushita Electric Industrial Company, Limited, Japan

Filed Nov. 12, 1981, Ser. No. 320,761
Claims priority, application Japan, Nov. 13, 1980, 55-160143
Int. Cl.³ F23N *5/00*
U.S. Cl. 431—76 **13 Claims**



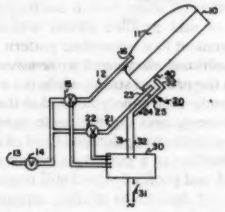
1. A liquid fuel burner comprising:
a capillary wick partially immersed in a fuel tank for vaporizing the liquid fuel;
means for igniting the vaporized fuel;
perforated, concentrically arranged inner and outer members for defining a primary combustion area adjacent to an upper edge of said wick to provide combustion of said ignited vaporized fuel with primary air supplied through the perforation of said inner and outer members thereby generating a primary flame, and a third member defining a secondary combustion area above said primary combustion area and admitting secondary air to said secondary combustion area for effecting the combustion of unburned component of said fuel vapor with the secondary air thereby generating a secondary flame;
an oxygen sensor located in said secondary flame and providing an output signal; and
a safety device operable in response to said output signal from said oxygen sensor,
said safety device comprising electrical burner control means including:
safety means responsive to an output signal from said oxygen sensor for removing said wick from said primary combustion area;
first timing means for activating said means for igniting for a first predetermined time period after energization of said burner control means; and
second timing means for locking said capillary wick in a predetermined position for a second predetermined time period after energization of said burner control means,
said fuel burner comprising:
wick positioning means for positioning said wick to a raised position and
power switch means responsive to said wick positioning means for energizing said burner control means when said wick is in said raised position,
said wick positioning means responsive to said second timing means for locking said capillary wick in said raised position for said second predetermined time period upon activation of said power switch means,
said safety means comprising further means for activating said wick positioning means to lock said capillary wick in said raised position in response to a signal from said oxygen sensor indicative of an oxygen concentration above a predetermined threshold and for deactivating said wick positioning means to unlock said capillary wick means in response to a signal from said oxygen sensing means indicative of an oxygen concentration less than said predetermined threshold.

4,534,728

COMBINATION GAS ENRICHER, SPARK IGNITER, FLAME SENSOR

Joseph A. Vogels, Long Beach, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 2, 1984, Ser. No. 595,878
Int. Cl.³ F23N *5/10*
U.S. Cl. 431—80 **3 Claims**



1. An improvement in an electrical ignition apparatus for igniting a main gas burner being supplied with an air and gas mixture having a high air to gas ratio wherein an air to gas ratio is reduced in an area where the electrical ignition apparatus produces an ignition spark to enhance ignition with less ignition power, the improvement comprising
a gas supply pipe and an igniter electrode connected by an insulating material to form a single unit adapted to be mounted adjacent a main burner receiving a gas mixture having a high air to gas ratio, said gas supply pipe being adapted to be connected to a source of gas under pressure for furnishing pure gas to the area where a spark is to occur to reduce said air to gas ratio,
a source of high voltage having two output terminals for producing an ignition spark, and
means connecting one of said output terminals to said igniter electrode and a second of said output terminals to said pipe whereby said ignition spark generated between said electrode and said pipe is surrounded by an air and gas mixture with a lower air to gas ratio than the gas mixture furnished to the main burner to enhance ignition of the main burner gas mixture.

4,534,729
MANTLE SUPPORT DEVICE

Ward L. Kelly, Santa Rosa, Calif., assignor to 49er Products, Sun Valley, Calif.

Filed Sep. 28, 1983, Ser. No. 536,748
Int. Cl.³ F21H 7/00
U.S. Cl. 431—110 15 Claims

1. In a device for the burning of gas by means of a mantle, the improvement being a support for said mantle comprising:

A. attachment means for connecting the support to a gas outlet tube emanating from said device;

B. lower body means connected to the attachment means characterized as being substantially incapable of communicating significant amounts of gas from the interior to the exterior of the lower body means;

C. upper body means connected to the lower body means characterized as having a substantially porous side wall for the communication of gas to the exterior of the upper body means, wherein said upper and lower body means comprises a wire wound in the shape of a spring;

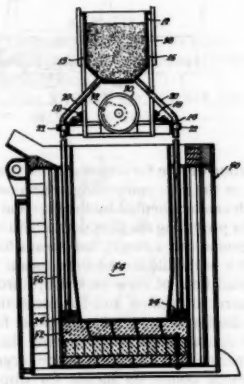
D. a support plate having a substantially circular configuration being connected to said upper body means; and

E. mantle piercing means emanating from said support plate.

4,534,730
METHOD OF AND APPARATUS FOR FORMING A LINER IN A FURNACE OR OTHER VESSEL

Richard B. Kraus, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Filed May 31, 1984, Ser. No. 615,773
Int. Cl.³ F27D 1/16; C21B 7/04
U.S. Cl. 432—3 10 Claims



1. An apparatus for forming a lining of particulate material in a vessel having an inner wall, a form being disposed in the vessel and being of a size such that a space separates the form from the inner wall, comprising:

a hopper for storing the particulate material;

a plurality of material delivery tubes communicating with the hopper and extending into the space between the form and the inner wall;

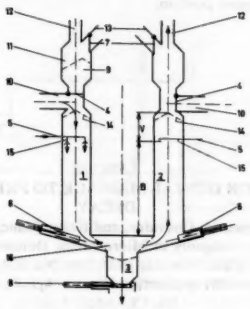
a compaction plate disposed in the space and having a plurality of bores therethrough communicating with the material delivery tubes; and

means for vibrating the hopper, material delivery tubes and the compaction plate so that the particulate material is transferred from the hopper to the space through the material delivery tubes and the compaction plate bores and is compacted by the compaction plate.

4,534,731
PROCESS AND APPARATUS FOR CALCINING LIMESTONE

Erwin Füssl, Zurich, and Max Ranner, Stallikon, both of Switzerland, assignors to Maerz Ofenbau AG, Zurich, Switzerland

Filed Jul. 12, 1983, Ser. No. 513,046
Claims priority, application Austria, Jul. 12, 1982, 2700/82
Int. Cl.³ F27B 15/00; F27D 1/08, 17/00
U.S. Cl. 432—14 5 Claims

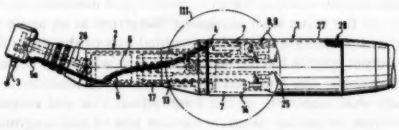


1. In a process for calcining limestone and similar mineral raw material in a parallel flow regenerative shaft furnace having at least two furnace shafts each being designed to define only a calcining zone and a preheating zone with a transfer duct interconnecting said furnace shafts, said furnace shafts being operated alternately one as calcining or parallel flow shaft and the other as a counterflow shaft, the improvement comprising discharging burnt lime from said furnace uncooled at the lower end of the calcining zone of the one of said shafts operating as the calcining shaft.

4,534,732
DENTAL HANDPIECE

Ernst Strohmaier, Bd. Schussenried, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH & Co., Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,693
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332627
Int. Cl.³ A61C 3/00
U.S. Cl. 433—29 21 Claims



1. In a dental handpiece, including a connector portion and an elongated, removable gripping sleeve portion coupled to

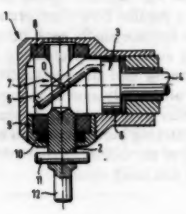
the connector portion so as to be axially rotatable thereabout; a treating implement arranged on a forward end of said sleeve portion distant from the connector portion; incandescent lamp means arranged eccentrically in said handpiece; and light conductor means in said gripping sleeve portion and having a forward end remote from the connector portion directed towards the treating implement, and a rearward end adapted to receive light from said incandescent lamp means; the improvement comprising in that said incandescent lamp is rotatable in conjunction with the gripping sleeve portion relative to the connector portion; slide contacts cooperate with contact rings to connect said incandescent lamp means with power supply lines in said connector portion; said incandescent lamp is arranged on a retainer rotatable along an arcuate path about a longitudinal axis of the handpiece; the retainer is arranged on a forward end of the connector portion facing the gripping sleeve portion; and said retainer includes first engaging means cooperating with complementary second engaging means on the gripping sleeve portion upon alignment of the incandescent lamp means with the rearward end of the light conductor means for transmission of the rotational movement of said gripping sleeve portion.

4,534,733

DEVICE FOR DENTAL MASSAGE TO PREVENT TOOTH DECAY

Michel Seigneurin, Douvaine, and Roger Blanc, Chambery, both of France, assignors to Micro-Mega, Besancon, France

Filed Nov. 22, 1983, Ser. No. 554,359
Claims priority, application France, Apr. 6, 1983, 83 05726
Int. Cl.³ A61C *3/03*
U.S. Cl. 433—122 **5 Claims**



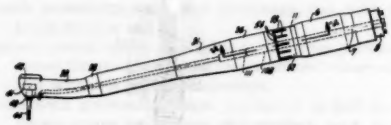
1. In a dental tool, a head on the tool, a rotary drive shaft driven rotationally about its longitudinal axis, an output spindle driven reciprocably rotationally from the rotary drive shaft and having a part thereof extending out of said head with its axis of rotation normal to the longitudinal axis of the rotary drive shaft, bearings in said head mounting the output spindle for reciprocatory rotation, a drive device coupling the rotary drive shaft and the output spindle and converting the rotary motion of the drive shaft to reciprocatory rotary motion of the output spindle comprising an eccentric stud mounted eccentrically on the drive shaft extending therefrom at an angle relative to a projection of the longitudinal axis of the drive shaft, the output spindle having an axial slit into which the eccentric stud extends, the stud having a point of connection to the rotary shaft eccentric to the longitudinal axis and extending therefrom to another point on another side of said longitudinal axis and eccentric thereto, the output spindle having surfaces coactive with the stud for driving the stud with said reciprocatory rotary motion when the drive shaft is driven rotationally.

4,534,734

SWIVEL DENTAL HANDPIECE

Joseph P. Lares, Redwood City, Calif., assignor to Lares Research, San Carlos, Calif.

Filed Jun. 9, 1983, Ser. No. 502,492
Int. Cl.³ A61C *1/08*
U.S. Cl. 433—126 **5 Claims**



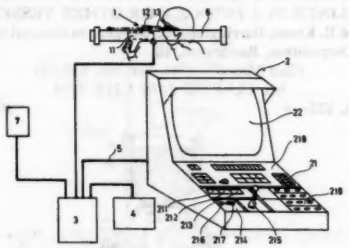
1. A swivel dental handpiece comprising a first hollow casing and a second hollow casing interengaged for relative rotation about an axis and for relative movement along said axis, means including a plurality of flexible fingers for releasably holding said first and said second casings against said relative movement along said axis, said fingers having spaces between them, an air turbine in said second hollow casing, means for supplying air to said turbine, and means for exhausting air from said turbine through said second hollow casing and between said fingers directly to the atmosphere.

4,534,735

FIRE SIMULATION DEVICE FOR TRAINING IN THE OPERATION OF SHOULDER WEAPONS AND THE LIKE

Jean-Claude Allard, Bourg la Reine; Rene Briard, Orgeval, and Christian Saunier, Ermont, all of France, assignors to Giravions Dorand, Suresnes, France

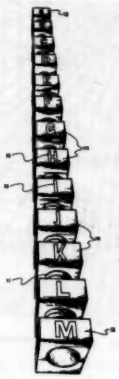
Filed Jul. 27, 1983, Ser. No. 517,618
Claims priority, application France, Jul. 29, 1982, 82 13239
Int. Cl.³ F41G *3/26*
U.S. Cl. 434—20 **8 Claims**



1. A simulation device for training in the operation of shoulder weapons or the like, comprising a weapon having a sighting line which can be oriented by the firer and is fitted with an optical unit for providing the firer with a field of view comprising a firing ground and a target, and means for initiating fictitious firing of a projectile by the firer, means for transmitting an image of said field of view picked up through the optical unit to an instructor station and for projecting said field of view on to a display screen, and a computer functionally connected to the optical unit for determining the position of impact of the projectile in the plane of the target, wherein said simulation device comprises means for displaying either a target locating contour in superimposition on an image of the target displayed on the instructor screen or a fictitious target on the instructor screen, occulting means for concealing the field of view from the firer at the instant of firing a shot while allowing the display target to remain on the screen of the instructor station at the time of occultation of the firer's field of view, and means for displaying the impact position with re-

spect to the target on the display screen of the instructor station.

4,534,736
EDUCATIONAL TOY
Ben Cogdill, 2771 E. Christofferson Cir., Ogden, Utah 84403
Filed Apr. 23, 1984, Ser. No. 602,713
Int. Cl.³ G09B *1/20*
U.S. Cl. 434—403 **3 Claims**

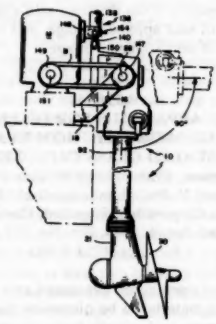


1. An educational toy for use by children and the like, comprising

a threaded shaft;

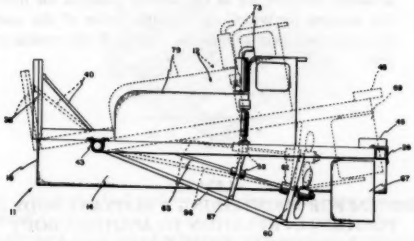
first block means rigidly affixed to one end of the threaded shaft; second block means rigidly fixed to the opposite end of the threaded shaft, said first and second block means having aligned faces; and a plurality of rotatable and traveling blocks, each being interiorly threaded to travel along the threaded shaft, spaced between the first and second rigidly fixed blocks, with the distance between the first and second rigidly fixed blocks being greater than the total thickness of the moveable blocks along the threaded shaft.

4,534,737
OUTBOARD MOTOR SYSTEM
Ronald C. Henderson, Cohassett, Mass., assignor to Mathewson Corporation, Quincy, Mass.
Filed May 17, 1983, Ser. No. 495,528
Int. Cl.³ B63H *5/12*
U.S. Cl. 440—53 **14 Claims**



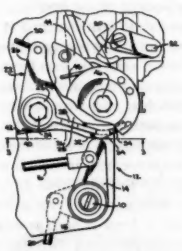
14. An outboard motor system comprising a propulsion assembly including a propeller and input shaft adapted to be pivotally suspended athwartship of a vessel for arcuate movement about a horizontal axis coinciding with its input shaft, a hydraulic cylinder for effecting elevation and depression of the propulsion assembly about said horizontal axis, a hydraulic clutch for establishing a driving connection between the input shaft and the propeller, a hydraulic motor for effecting steering, said hydraulic clutch, hydraulic cylinder and hydraulic motor comprising integrated component parts and the propulsion assembly, and a hydraulic pump mounted to the propulsion assembly and coupled to the input shaft for supplying hydraulic pressure to said cylinder, clutch and motor.

4,534,738
TUG TYPE VESSEL
Thomas J. McKnight, New Bern, N.C. 28560
Filed Mar. 9, 1982, Ser. No. 356,354
Int. Cl.³ B63H *5/12*; B63B *1/12*
U.S. Cl. 440—61 **6 Claims**



1. A tug type vessel comprising: at least two spaced water supported float means; a propulsion means including an engine, a transmission, a V-drive, a propeller, and a rudder operatively associated with each other to form an integral unit pivotably mounted between said float means; a pilot house means operatively mounted on said propulsion means; hydraulic means for pivoting said propulsion means and its pilot house relative to said float means; and tug type push knee means forwardly extending from said propulsion means whereby a variable draft tug type vessel is provided.

4,534,739
RECOIL STARTER LOCK AND NEUTRAL GEAR THROTTLE LIMIT FOR MARINE DRIVES
Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corp., Skokie, Ill.
Filed Dec. 23, 1983, Ser. No. 564,882
Int. Cl.³ F02N *17/00*
U.S. Cl. 440—84 **5 Claims**



1. In a marine drive having a rotatable shaft operable between neutral and drive positions, a throttle control means for opening and closing the throttle valve of the marine drive, and

a recoil starter lock, an improved means for releasing the starter lock and limiting throttle opening when the shaft is in the neutral position, said means comprising:

a cam mounted on said shaft for movement therewith, said cam being mounted normal to the axis of rotation of the shaft;

a recoil starter lock actuator member coacting with said cam and pivotally movable about a pivot point by the movement of said cam between the neutral and drive positions, said recoil starter lock actuator member having a generally L-shaped configuration with a pair of angularly displaced arms extending outwardly from said pivot point, a first of said arms being coupled to said recoil starter lock for releasing the lock when the shaft and said cam and actuator member are in the neutral position, the second of said arms having a rise and fall configuration for moving said actuator means by coaction with said cam, one of said arms having a stop thereon; and

a stop on the throttle control means engaging said stop on said actuator member when the shaft and said cam and actuator member are in the neutral position for limiting the amount by which the throttle valve of the marine drive can be opened when the shaft is in the neutral position.

4,534,740

SYSTEM FOR MAINTAINING A BUOYANT BODY IN POSITION IN RELATION TO ANOTHER BODY

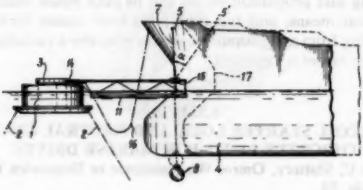
Leendert Poldervaart, La Turbie, France, assignor to Single Buoy Moorings, Inc., Marly, Switzerland

Filed Jun. 9, 1983, Ser. No. 502,733

Claims priority, application Netherlands, Jun. 9, 1982, 8202334

Int. Cl.³ B63B *21/52*

U.S. Cl. 441—3 **4 Claims**



1. In a mooring system for maintaining a vessel on the surface of a body of water in a position in relation to a body which is secured to the bottom of the body of water, which mooring system comprises a rigid arm attached at one end of the arm to said body for horizontal swinging movement relative to said body about a vertical axis, said arm having its other end cooperating with connecting means which are suspended from the vessel and are attached to a weight, the point of cooperation between said connecting means and the rigid arm being situated between the suspension point of the connecting means and the weight; the improvement in which said connecting means comprise at least one flexible cable directly connected to the vessel at its upper end, said rigid arm and said point of cooperation being disposed at least as high as said surface of said body of water and said weight being disposed below said surface of said body of water, said arm and said vessel being movable horizontally relative to each other, the weight urging said vessel to move horizontally toward a position in which the connecting means above the arm is vertical.

4,534,741

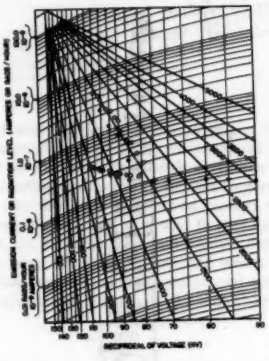
METHOD FOR ASSESSING THE DIELECTRIC STATE OF A HIGH VOLTAGE VACUUM DEVICE USING RADIATION GENERATED BY FIELD EMISSION CURRENT

George A. Farrall, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 5, 1984, Ser. No. 568,318

Int. Cl.³ H01J *9/50*

U.S. Cl. 445—3 **11 Claims**



4. A method for assessing the dielectric state of a high voltage vacuum device of the type having a vacuum chamber housing enclosing a cathode and an anode, by using the radiation generated by field emission currents to determine the field enhancement factor, β, associated with said dielectric state, which factor is inversely proportional to the dielectric strength of said vacuum device, comprising:

applying a variable voltage across the gap between said cathode and said anode of said high voltage vacuum device, with said voltage being less than that required to produce breakdown, so as to produce field emission current between said cathode and said anode;

measuring the radiation produced by electrons from said field emission current striking said anode, while varying said variable voltage;

correlating said radiation measurement for each value of said variable voltage to the amount of field emission current between said cathode and said anode corresponding to each value of said variable voltage, by means of a predetermined relationship which is a function of said radiation measurement and said applied voltage; and

determining said field enhancement factor, β, from the slope of a plot in which the ordinate is the logarithm of the quantity resulting from dividing said emission current by the square of said applied voltage, and the abscissa is the reciprocal of said applied voltage.

4,534,742

METHOD AND APPARATUS FOR DISPENSING SMALL QUANTITIES OF MERCURY FROM EVACUATED AND SEALED GLASS CAPSULES

Mark W. Grossman, Framingham; William A. George, Rockport, and Robert Y. Pai, Hamilton, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

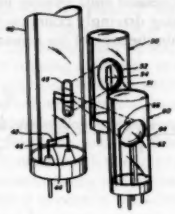
Filed Jan. 4, 1984, Ser. No. 568,023

Int. Cl.³ H01J *9/395*

U.S. Cl. 445—9 **14 Claims**

1. A method of opening an evacuated and sealed glass capsule containing a material to be dispensed having a relatively high vapor pressure, said capsule being disposed in an evacuated envelope, said method comprising the steps of: radiating the capsule from a first light source imaged along the capsule,

substantially simultaneously radiating the capsule from a second light source imaging substantially transversely to the imaging of the first light source, and constraining a segment of



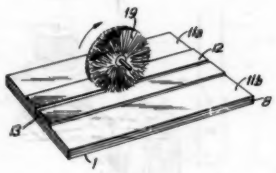
the capsule by constraining means about the capsule which restricts formation of the bubble occurring from said radiating steps.

4,534,743

PROCESS FOR MAKING AN ELECTROLUMINESCENT LAMP

Anthony D'Onofrio, West Hartford, and Walter Kitik, Wolcott, both of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Aug. 31, 1983, Ser. No. 528,310
Int. Cl.³ H01J 9/02
U.S. Cl. 445—24 **4 Claims**



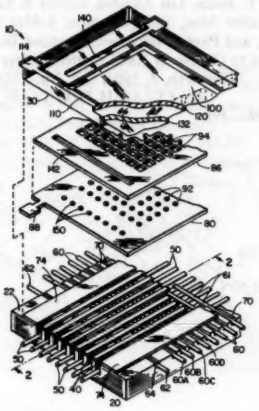
1. The process of making a flexible split-electrode electroluminescent lamp, comprising the steps of:
providing a transparent flexible carrier strip of insulating plastic material,
providing a first continuous thin transparent coating of electrically conductive material on said carrier strip,
moving said carrier strip at a substantially continuous rate of speed,
depositing a slurry of a mixture of uncured resin binder and electroluminescent phosphor material continuously on said coated carrier strip to a controlled depth,
curing the resin to bind the phosphor material in a flexible matrix and adhering it to said first coating,
depositing a slurry of liquid-borne conductive particulate matter continuously on said carrier strip as it moves,
drying said slurry to provide a second continuous coating of electrically conductive material on top of said flexible matrix,
removing conductive material to define a narrow groove in said second one of said conductive coatings, wherein said conductive material is removed from said second coating by applying a solvent and brushing the coating while protecting the unremoved coating with a shielding device thereby providing at least two laterally spaced contiguous electrodes formed from the same conductive layer, and
cutting said carrier strip into a desired lamp size, having exposed conductive sections on said respective contiguous electrodes which are adapted for attachment of electric contact terminals.

4,534,744

DISPLAY PANEL AND METHOD OF MAKING IT

Philip Kuznetzoff, Bridgewater, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 2, 1983, Ser. No. 490,495
Int. Cl.³ H01J 9/00
U.S. Cl. 445—47 **3 Claims**



1. The method of making a display panel comprising the steps of
forming a plurality of relatively deep parallel, longitudinal first slots in a glass base plate having a top surface,
securing an anode electrode in each of said first slots,
providing a plurality of cathode electrodes adjacent to the top surface of said base plate oriented generally transverse to said anode electrodes,
said cathode electrodes crossing said anode wires and forming a first glow cell at each crossing, said first glow cells being disposed in rows and columns in a first layer,
placing means comprising strips of insulating material on said base plate overlying said cathodes,
mounting an electrode plate on said base plate, said electrode plate having an array of small holes, each of which overlies one of said first glow cells,
preparing a face plate assembly made up of a glass plate having two surfaces, on one of which is formed a large-area transparent electrode covered by a thin layer of glass which is covered by a second insulating layer and a third insulating layer having an array of apertures therein,
mounting said face plate assembly on said electrode plate with the apertures in said third insulating layer aligned with the small holes in said electrode plate, and
hermetically sealing together all of said parts to form the completed panel and filling the panel with an ionizable gas,
said third insulating layer in said face plate assembly being prepared by
forming on the bottom surface of a glass plate, in order, first a large-area transparent electrode, second a layer of glass, and third a layer of insulating material,
providing a layer of photosensitive material on said third layer,
exposing said layer in a pattern and developing said pattern in said layer to render portions thereof resistant to removal,
removing portions of said layer to leave an apertured insulating plate which is the reverse of said third insulating layer and has solid material where said third insulating layer has apertures,
providing areas of insulating material in the apertures in said insulating plate, and

removing all of apertured insulating plate to leave said areas of insulating material which comprise said third layer of insulating material.

4,534,745

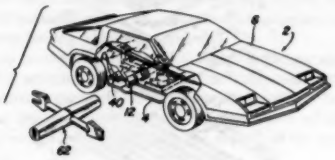
PERCUSSION CAP FIRING TOY VEHICLE AND TRACK ASSEMBLY

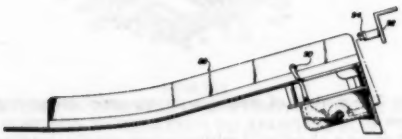
Lawrence T. Jones, Los Angeles; Robert S. Lee, Westlake Village; Walter Moe, Santa Monica; Ashley G. Howden, Los Angeles, and Paul J. Ishikawa, Hermosa Beach, all of Calif., assignors to California R&D Center, Culver City, Calif.

Filed Feb. 3, 1984, Ser. No. 576,867

Int. Cl.³ A63H *5/00, 29/00*

U.S. Cl. 446—398 **21 Claims**





1. A toy vehicle capable of igniting a toy cap comprising:

a housing body member;

means for transporting the body member across a support surface;

a striker member pivotally mounted within the housing member;

means for biasing the striker member to rotate in a predetermined direction;

a keeper member movably mounted in the housing member for selective retention of the biased striker member in a biased position, a portion of the keeper member extending beyond the housing body member in a position to permit actuation for releasing the striker member; and

a movably mounted door connected to the housing member and carrying an anvil for mounting a toy percussion detonatable cap, the position of the anvil within the housing member with the door in a closed position being within the operative striking movement of the striker member.

4,534,746

COUPLING FOR THE DETACHABLE CONNECTION OF A SUBDIVIDED DRIVE SHAFT OF A MOTOR VEHICLE

Otto Hausinger, Gerlingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche A.G., Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 416,000

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1981, 3135689

Int. Cl.³ B60K *17/22;* **F16D** *1/00*

U.S. Cl. 464—170 **4 Claims**

1. A coupling for detachably connecting portions of a subdivided drive shaft operatively connecting a forwardly disposed drive unit with a rearwardly disposed transmission unit of a motor vehicle, the coupling comprising a plurality of shell means for connecting opposed ends of the portions of the subdivided drive shaft, means for fastening the plurality of shell means relative to one another when said coupling is in an assembled condition, and unitary ring means surrounding said plurality of shell means for maintaining the plurality of shell means relative to one another when said coupling is in a disassembled condition, said means for fastening engaging means associated with each of the opposed ends for preventing axial displacement of the opposed ends relative to one another and said opposed ends being drivingly connected with each other by said coupling within the area of the transmission unit when

said coupling is in the assembled condition, said unitary ring means surrounding the shell means with a clearance when said coupling is in the assembled condition for enabling movement of the plurality of shell means relative to one another during disassembly and maintaining said plurality of shell means relative to one another when said coupling is in the disassembled condition, said plurality of shell means including means for positioning said unitary ring means relative thereto.

4,534,747

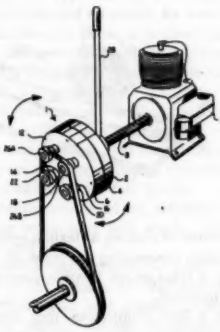
TRANSMISSION

Clement J. Fitzsimmons, 12338 Lakeshore Dr., Lakeside, Calif. 92040

Filed Aug. 12, 1983, Ser. No. 522,598

Int. Cl.³ F16H *9/00*

U.S. Cl. 474—1 **9 Claims**



1. A transmission for transmitting rotational power from an engine to a drive shaft comprising:

(a) a first shaft means for transmitting rotational power from the engine to the transmission,

(b) a casing coaxially rotatable about the first shaft, the first shaft extending into the casing through an orifice defined by the casing,

(c) first, second, third and fourth casing pulleys each rotatably affixed to the casing and spaced apart from each other such that each of the pulleys occupies one corner of an imaginary square, the planes of all the pulleys being aligned in a single plane generally perpendicular to the axis of casing rotation, the first and second casing pulleys occupying adjacent corners of the imaginary square, the diagonals of the imaginary square intersecting a longitudinal axis of the first shaft,

(d) a means disposed within the casing to transmit rotational power from the first shaft to the first casing pulley such that the first casing pulley rotates in a direction opposite to the direction of rotation of the first shaft,

(e) a means disposed in the casing to transmit rotational

power from the first shaft to the second casing pulley such that the second casing pulley rotates in the same direction as the direction of rotation of the first shaft,

(f) a pulley affixed to a drive shaft, the plane of the pulley being aligned with the plane of the casing pulleys,

(g) a belt means for coupling the drive shaft pulley with at least two of the casing pulleys, and

(h) a means for rotating the casing to at least a first, second, and a third position, the drive shaft pulley being adapted to permit the belt when suitably taut to be in contact with only two casing pulleys when the casing is in the first, second and third positions, the first position being when the belt is in contact with the first casing pulley and either the third or fourth casing pulley, the second position being when the belt is in contact with only the third and fourth casing pulleys, the third position being when the belt is in contact with only the second casing pulley and either the third or fourth casing pulley.

4,534,748

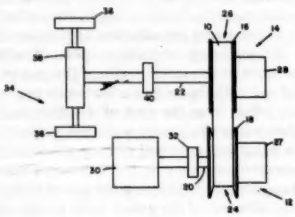
VARIABLE SPEED BELT DRIVEN TRANSMISSION SYSTEM AND METHOD

Richard F. Stieg, Boulder; John P. Dolan, Littleton; W. Spencer Worley, Aurora, all of Colo., and Göran Gerbert, Staffanstorp, Sweden, assignors to The Gates Rubber Company, Denver, Colo.

Filed Dec. 30, 1981, Ser. No. 335,981

Int. Cl.³ F16H *55/56, 11/06, 55/54, 55/52*

U.S. Cl. 474—17 **18 Claims**



1. In a variable speed belt drive system of the type with a driver pulley having axially separable pulley halves; a driven pulley having axially separable pulley halves responsively operable to axial forces variable with rotational torque for closing the driven pulley halves together; a V-belt entrained by the driver and driven pulleys, the driven pulley axial forces and driver pulley cooperatively causing variable belt tensions for transmitting predetermined power loads between the driver and driven pulleys from (1) a maximum (speed down) ratio where the driver pulley halves are axially separated to a full open position and the driven pulley halves are axially together to a full closed position to a (2) a minimum (speed up) ratio where the driver pulley halves are axially together to a full closed position and the driven pulley halves are axially separated to a full open position; and a family of ideal driven pulley axial force lines, each force line of the family corresponding to a specific torque value expressed as a percentage of the maximum input torque at the driver pulley, each force line representing, for its specific torque value, the locus of points where slip is impending between the belt and driven pulley for corresponding maximum input torques at the driver pulley between the minimum ratio and the maximum ratio, the force lines generally decreasing from the driven pulley full closed position to the full open position, the improvement comprising:

an actuator means for closing the driven pulley halves while generating an operating family of axial closing forces that follow the ideal force lines of the required driven pulley axial forces to the extent that the maximum generated axial force to close the driven pulley at 100 percent peak input torque exceeds the ideal force by no more than 120 percent.

4,534,749

PULLEY

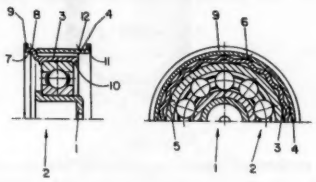
Rudiger Hans, Niederwerrn; Manfred Brandenstein, Eussenheim; Wolfgang Friedrich, Schweinfurt, and Roland Haas, Lendershausen, all of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed May 10, 1983, Ser. No. 493,367

Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217579

Int. Cl.³ F16H *55/36*

U.S. Cl. 474—174 **11 Claims**



1. In a pulley comprised of a support body and a roller casing rotatably mounted thereon by a bearing; the improvement wherein the roller casing is comprised of an outer ring part coaxially over one inner ring part, said inner ring having radially outwardly directed projections radially supporting said outer ring.

4,534,750

AUTOMOTIVE V-BELT

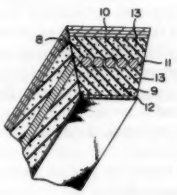
Shigeki Okumoto, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1982, Ser. No. 413,721

Claims priority, application Japan, Sep. 12, 1981, 56-135694[U]

Int. Cl.³ F16G *5/06*

U.S. Cl. 474—261 **4 Claims**



1. An automotive V-belt useful for power transmission to drive accessory units to an automotive internal combustion engine, in which the inner material of the belt consists of rubber, an elongation-inhibiting member embedded in the rubber, and a surface smoothing agent for reducing attachment of dust to the belt surface dispersed throughout the cross-section of the rubber.

4,534,751

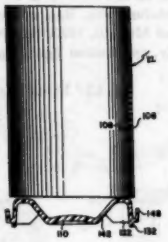
THERMOPLASTIC CONTAINER END AND METHOD AND APPARATUS FOR INERTIAL SPINWELDING OF THERMOPLASTIC CONTAINER ENDS

Vincent Fortuna, Huntington Beach, Calif., and Donald MacLaughlin, Midland, Mich., assignors to Cosden Technology, Inc., Dallas, Tex.

Division of Ser. No. 405,642, Aug. 5, 1982, , which is a continuation-in-part of Ser. No. 234,344, Feb. 13, 1981, abandoned. This application May 2, 1983, Ser. No. 490,610

Int. Cl.³ B29C *27/08, 19/00;* B32B *31/00*

U.S. Cl. 493—108 3 Claims



1. A method of making a container having a paperboard sidewall portion and a thermoplastic end portion spinweld bonded thereto, comprising the steps of:

providing a thermoplastic container end comprising

(a) a first portion for receiving one end of the container sidewall, said first portion comprising a first annular groove formed by a first wall member extending from the bottom of said groove and adapted to lie on the outer surface of the container sidewall and a second wall member relatively longer than said first wall member and extending from the bottom of said groove and being adapted to enter into the container and lie on the inner surface of the container sidewall; and

(b) a second portion, connected to said second wall member at a position remote from said first wall member and near the end of said second wall member adapted to enter into the container, said second portion including means for transferring to a direction normal to a spinwelded bond, any shear forces which arise due to axial forces on the container end which tend to shear said spinwelded bond, said shear force transmitting means comprising (i) an end-wall portion connected to and extending from said second wall member in a serpentine manner to form therewith a second annular groove of generally opposite orientation from said first annular groove and (ii) a plurality of circumferentially spaced radial ribs, extending between said second wall portion and said serpentine end-wall portion, said plurality of ribs being operable to transfer forces acting on said container end from shearing said spinwelded bond;

positioning said paperboard sidewall on a first mandrel having a vertical axis;

positioning said container end on a second mandrel, coaxial with said first mandrel;

rotating said second mandrel about said axis whereby said radial ribs on said end portion engage driving means on said second mandrel to rotate said end portion;

positioning an end of said paperboard sidewall into said first annular groove of said container end, whereby said shear force transmitting means supports said second wall member against lateral deflection and whereby the rotary inertia of said second mandrel generates frictional heat which spinweld bonds said container to said sidewall.

4,534,752

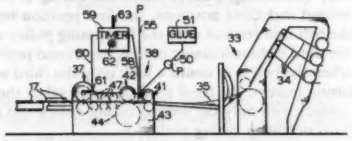
APPARATUS AND METHOD FOR SECURING TOP ENDS OF SACK GUSSETS

Robert A. Ferrell, Shelbyville, and Richard G. Rebber, Flat Rock, both of Ind., assignors to KCL Corporation, Shelbyville, Ind.

Continuation of Ser. No. 383,986, Jun. 1, 1982, abandoned. This application Apr. 12, 1984, Ser. No. 599,216

Int. Cl.³ B31B *1/62, 1/84*

U.S. Cl. 493—213 15 Claims



1. In apparatus for making sacks having openable tops for access into the sacks, and each sack adapted to carry separable closure means across its top:

means for transporting along a given path sack blanks each having an expansion gusset on at least one side and with an end of the gusset adjacent to a bag top end of the sack blank;

and means located along said path for applying securing means selectively to said gusset end of each sack blank but leaving the remainder of the gusset of each sack blank freely expansible and leaving the openable top of each sack blank free for opening, and comprising means for spreading the gusset to facilitate application of adhesive to the inside of the gusset, an adhesive applicator selectively operable for applying respective spots of adhesive to limited portions at the inside walls of the gusset adjacent to said end and with the spot of adhesive on one wall being tansversely offset from the spot of adhesive on the other wall so that when the gusset walls are pressed back together the adhesive spots will engage adhesive-free areas of the respective opposing walls, and means downstream from said applicator for pressing the gusset walls together for assuring adhesion of the gusset walls to one another by means of the offset spots of adhesive.

4,534,753

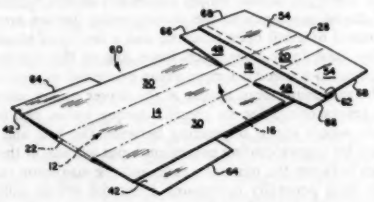
METHOD OF FORMING INTERMEDIATE FOLDED BLANKS FOR CENTER SPECIAL SLOTTED CONTAINERS

Oscar J. Kistner, Cincinnati, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 317,103, Nov. 2, 1981, Pat. No. 4,477,002. This application Dec. 9, 1983, Ser. No. 559,672

Int. Cl.³ B31B *1/26, 1/62*

U.S. Cl. 493—453 5 Claims



1. A method of forming an intermediate folded blank for a center special slotted container comprising the steps of:

selecting a blank having a full end panel, a first side panel joined to a side of said full end panel along a score line and having a length greater than that of said full end panel, a

second side panel joined to a side of said full end panel along a score line opposite said score line joining said full end panel to said first side panel, said second side panel having a length equal to that of said first side panel, a first full end flap joined to said full end panel along a score line and extending from a longitudinal edge thereof, said first full end flap being substantially equal in length to one-half said lengths of said first and second side panels, first and second cover flaps joined to said first and second side panels, respectively, along score lines and extending from longitudinal edges thereof such that said first and second cover flaps are correspondingly disposed to said full end flap, said first and second cover flaps having lengths less than that of said full end flap, a first partial end panel joined to said first side panel along a score line opposite said score line joining said first side panel to said full end panel, a second partial end panel joined to said second side panel at a score line opposite said score line joining said first side panel to said full end panel, said first and second partial end panels having a combined length at least equal to that of said full end panel, a first partial end flap joined to said first partial end panel along a score line and extending from a longitudinal edge thereof, said first partial end flap being equal in length to and correspondingly disposed to said first full end flap, and a second partial end flap joined to said second partial end panel along a score line and extending from a longitudinal edge thereof, said second partial end flap being equal in length to and correspondingly disposed to said first partial end flap;

folding said blank along one of said score lines joining said full end panel to one of said side panels and along one of said score lines joining one of said partial end panels to a contiguous other one of said side panels such that said partial end panels both overlap said other one of said side panels and are contiguous with respect to each other, thereby forming a folded blank;

squaring said blank by contacting only opposing edges of said blank defined by outer edges of said full end flap and said first and second partial end flaps on one side, and longitudinal edges of at least said end panels on an opposite side of said blank; and

sealing said first partial end panel to said second partial end panel.

4,534,754

FEEDER FOR CENTRIFUGAL APPARATUS

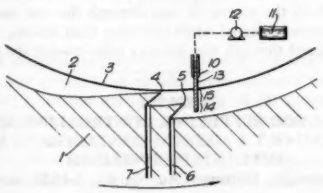
David Shepherd, Cheshire, England, assignor to Imperial Chemical Industries PLC, Hertfordshire, England

Filed May 30, 1984, Ser. No. 615,273

Claims priority, application United Kingdom, Jun. 7, 1983, 8315611

Int. Cl.³ B01D *45/12*; B04B *11/00*

U.S. Cl. 494—37 **9 Claims**



1. Apparatus for providing a regulated flow of liquid medium to a device mounted in or on a rotor of a centrifuge rotatable with respect to a housing, comprises in combination,

a scoop located in or on the rotor and comprising a mouth opening forwards in the direction of rotation of the rotor and a duct connecting the mouth to the device; and

a nozzle located in or on the housing and being adapted for receiving the liquid medium from a source and for projecting the received liquid medium as a free moving jet into the path of the scoop as it rotates with the rotor;

the scoop, source of liquid medium and nozzle all being mutually dimensioned and positioned such that during operation as the rotor rotates, the mouth of the scoop strikes and removes a mid-portion of the jet of liquid medium and directs it via the duct to the device, the continuing projection of the liquid medium then extending the jet again beyond the path of the scoop so that a further mid-portion of the jet can be removed during each subsequent revolution of the rotor.

4,534,755

CENTRIFUGES

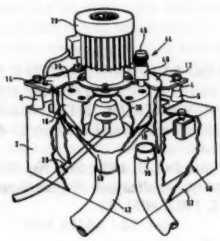
Colin Calvert, Ampthill, and Peter Cox-Smith, Bletchley, both of England, assignors to Hoccum Developments Limited, Slough, England

Filed Feb. 22, 1983, Ser. No. 468,562

Claims priority, application United Kingdom, Feb. 22, 1982, 8205209

Int. Cl.³ B01D *21/26*

U.S. Cl. 494—37 **3 Claims**



1. A method of operating a centrifuge, the method comprising a separating stage and a solids removal stage, wherein the separating stage includes passing a suspension containing a less dense and a more dense material into the rotor of the centrifuge, and rotating the rotor in one direction so that the more dense material separates from the less dense material to accumulate on an inwardly facing surface of the rotor, and wherein the solids removal stage commences when the more dense material has accumulated in this manner, sequence of deceleration and acceleration of the rotor to dislodge the accumulated more dense material from the inwardly facing surface, thereby to facilitate the removal of said more dense material from the rotor.

4,534,756

FAULT DETECTION APPARATUS AND METHOD FOR PARENTERAL INFUSION SYSTEM

Peter E. Nelson, Mountain View, Calif., assignor to Ivac Corporation, San Diego, Calif.

Filed Apr. 11, 1983, Ser. No. 483,903

Int. Cl.³ H61M *5/00*

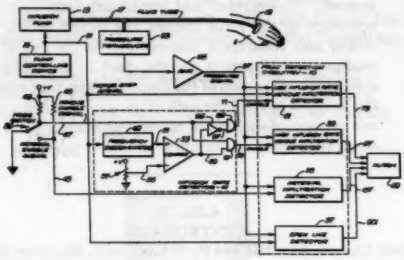
U.S. Cl. 604—50 **53 Claims**

1. Fault detection apparatus for use with a parenteral administration system having an infusion device for infusing parenteral fluid through a fluid tube to the vascular system of a patient, comprising:

pressure transducer means for monitoring the pressure of the fluid in the fluid tube and producing a corresponding pressure signal;

fault detection means for evaluating the pressure signal over a period of time to detect characteristic patterns in the waveform of the pressure signal evaluated which are

indicative of improper fluid communication between the fluid tube and the vascular system of the patient; and



means for producing a corresponding alarm signal whenever the fault detection means detects such a characteristic pattern.

4,534,757

DEVICE FOR RELEASING ACTIVE INGREDIENT, INSERTABLE IN A SYSTEM OF PARENTERAL ADMINISTERING THE INGREDIENT

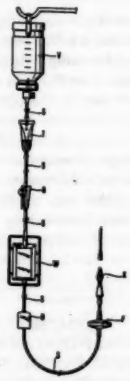
Leo Geller, Riehen, Switzerland, assignor to ALZA Corporation, Palo Alto, Calif.

Filed Jun. 3, 1983, Ser. No. 500,744

Claims priority, application Switzerland, Jun. 14, 1982, 3668/82; Jul. 2, 1982, 4051/82

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—85 **10 Claims**



1. A device for releasing active ingredient, which device is insertable in the liquid flow line of a system for the parenteral application of the ingredient, and comprises a receptacle having an inlet and outlet for a liquid flow passing therethrough, and ingredient-releasing means, lodged in the receptacle, for releasing active ingredient into the said liquid flow, said receptacle further comprising in its interior two liquid flow paths leading from the inlet to the outlet thereof, one of which paths comprises a section through which the liquid passes in a direction substantially opposite to a general direction in which the receptacle is passed by the liquid, and an ingredient-releasing unit being present in the said path section of opposite liquid flow.

4,534,758

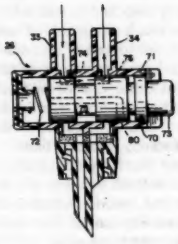
CONTROLLED RELEASE INFUSION SYSTEM

Michael J. Akers, Greenwood; William W. Hargrove, Indianapolis; Dale C. Harris, Fairland, all of Ind., and Charles R. Sperry, Westport, Conn., assignors to Eli Lilly & Company, Indianapolis, Ind.

Filed Jul. 15, 1983, Ser. No. 514,268

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—85 **11 Claims**



1. Apparatus for connecting a vial in the delivery tube of an intravenous administration set, the set including a source of fluid connected to one end of the delivery tube, the other end of which is adapted to be inserted in a patient, the apparatus comprising:

a valve having three operating positions and including bypass means operable in the first operating position for conducting fluid from the fluid source toward the patient, dilution means operable in the second operating position for admitting fluid from the source to the vial while permitting air to escape from the vial, and delivery means operable in the third operating position for directing the fluid from the source to pass through the vial and dilute the contents thereof while directing fluid leaving the vial to proceed through the delivery tube toward the patient.

4,534,759

VALVE FOR SUPPLYING, CONTROLLING AND TAKING OUT A MEDIUM CONTAINED IN AN IMPLANTED CONTAINER

Werner Trawöger, Höttinger Au Nr. 60, A-6020 Innsbruck, Austria

PCT No. PCT/AT82/00011, § 371 Date Mar. 7, 1983, § 102(e) Date Mar. 7, 1983, PCT Pub. No. WO83/00367, PCT Pub. Date Feb. 3, 1983

PCT Filed Apr. 19, 1982, Ser. No. 488,543

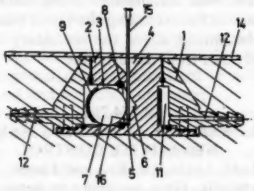
Claims priority, application Austria, Jul. 16, 1981, 3137/81

Int. Cl.³ A61B *17/34*

U.S. Cl. 604—117 **9 Claims**

1. Valve for supplying, controlling and taking out a medium

contained in an implanted container, comprising a valve body having an exterior and an interior, wherein a flow channel is provided which widens conically toward the exterior of said valve body for the introduction of an injection needle and which runs into a chamber in the interior of the valve body, said chamber being connectable with said container, and in which chamber a closure member acted upon by a reset means is inserted which clears said flow channel when said injection



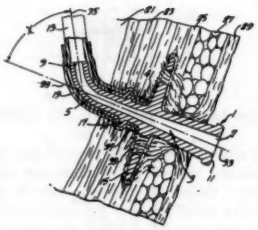
needle is inserted and recloses when it is taken out, characterized in that said flow channel (3) comprises an introduction channel (5) for said injection needle (15) in the form of a first pocket bore terminating at a needle penetration limiting end portion in said chamber and a second pocket bore (6) angularly arranged crosswise relative to and intersecting said introduction channel (5), which said second pocket bore receives said closure member (7), whereby said closure member (7) projects into said introduction channel (5) in the closed condition.

4,534,760

ANGULAR IMPLANT DEVICE

Donald A. Raible, Irvine, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

Continuation of Ser. No. 292,844, Aug. 14, 1981, abandoned.
This application Jun. 26, 1984, Ser. No. 624,801
Int. Cl.[3] A61F *1/00*; A61M *25/00*
U.S. Cl. 604—175 **3 Claims**



1. A ureterostomy device comprising: a passageway having an anchor means, both of which are formed from a material selected from the group consisting of (1) pyrolytic carbon disposed on a graphite substrate and (2) vitreous carbon, for attachment to an opened vessel;

said anchor means for establishing a biological anchor; and

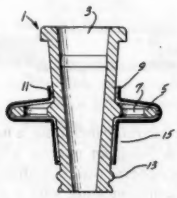
said passageway being further defined as having a substantially rigid inlet section initiated with a passageway inlet and a substantially rigid outlet section terminated with a passageway outlet and in communication with said inlet section wherein the axial centerline passing through the center of said passageway inlet is inclined with respect to the axial centerline passing through the center of said passageway outlet from between about 45 degrees and about 75 degrees.

4,534,761

IMPLANT DEVICE

Donald A. Raible, Irvine, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

Continuation of Ser. No. 292,845, Aug. 14, 1981, abandoned.
This application Oct. 6, 1983, Ser. No. 539,622
Int. Cl.[3] A61M *31/00*; A61F *1/00*
U.S. Cl. 604—175 **7 Claims**



1. An implant device comprising:

a passageway having an anchor means, both of which are formed from a material selected from the group consisting of (1) pyrolytic carbon disposed on a graphite substrate of (2) vitreous carbon, for attachment to an opened vessel;

said anchor means for establishing a biological anchor;

a grafting mesh annularly and longitudinally disposed about at least a portion of the exterior of said implant device, said grafting mesh being formed from a material selected from the group consisting of (1) pyrolytic carbon disposed on a graphite substrate or (2) vitreous carbon; and

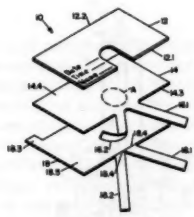
means for radially and longitudinally spacing said grafting mesh away from the exterior of said implant device such that tissue is permitted to grow between the exterior of said implant device and said mesh longitudinally on both sides of said space means.

4,534,762

VASCULAR PUNCTURE DRESSING

Hal B. Heyer, 5546 Perry Ave. N., Crystal, Minn. 55429

Filed Dec. 27, 1982, Ser. No. 453,606
Int. Cl.[3] A61M *25/02*
U.S. Cl. 604—180 **3 Claims**



1. A dressing for covering a vascular puncture wound and for stabilizing a cannula extending into the wound against movement, the dressing comprising means defining a section of adhesive tape having forward and rearward edges and having a recess in said forward edge through which a vascular puncture wound may be observed; means defining a transparent sheet carried by the section of adhesive tape and extending across said recess, and means defining at least a pair of flexible tape strips carried by the dressing and extending forwardly beyond the forward edge of the adhesive tape section and adapted to be wrapped about the hub of a cannula and adhered to a patient's skin adjacent a puncture wound or to the dressing to stabilize the hub against movement.

4,534,763

HYPODERMIC CARTRIDGE

William A. Gettig, Linwood, Box 417, Millheim, Pa. 16854, and Gerald S. Fetterolf, P.O. Box 53, Madisonburg, Pa. 16852

Filed Sep. 14, 1983, Ser. No. 532,050
Int. Cl.³ A61M 5/00
U.S. Cl. 604—239 10 Claims

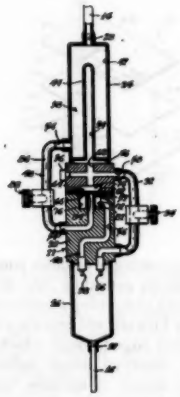
1. A hypodermic cartridge including, a barrel provided with a peripheral wall defining an interior adapted to contain a medicament, said peripheral wall including an inner surface, a forward end wall communicating with a nose projecting forward of said end wall, said nose having a bore communicating with said barrel interior, a cannula provided with a central passageway, said cannula including a substantially straight main section having a rear portion disposed in said nose bore, said cannula having an inner end projecting from said rear portion into said barrel interior, said cannula inner end angularly deflected toward said barrel peripheral wall to provide a bent inner end, said forward end wall tapered from said barrel peripheral wall to said bore of said nose, said cannula bent inner end disposed at an angle substantially coinciding with that of said forward end wall and flushly engaging same throughout its extent, said bent inner end provided with a distal portion juxtaposed said barrel inner surface, and said cannula distal portion juxtaposed the intersection of said barrel peripheral wall and forward end wall whereby, upon aspiration blood is readily visually detected at said cannula distal portion through said barrel wall.

4,534,764

SEQUENTIAL MEDICATION DELIVERY DEVICE

Herbert Mittleman, Deerfield, and Stanislaw Sulek, Chicago, both of Ill., assignors to Trimedyne, Inc., Santa Ana, Calif.

Filed Jul. 25, 1983, Ser. No. 517,224
Int. Cl.³ A61M 5/00
U.S. Cl. 604—81 22 Claims



1. A sequential medication delivery device for administering plural medications to a patient, the device comprising:

(a) an inlet means for receiving a primary medication from a primary medication source;

(b) an outlet means for placement in fluid communication with the patient;

(c) a liquid passageway means in fluid communication between the inlet means and the outlet means;

(d) a housing defining a chamber adapted to receive a secondary medication and in fluid communication with the outlet means; the housing also including a volume reducing means in fluid communication with the inlet means for reducing the volume of the chamber to deliver secondary medication from the chamber to the outlet means; and

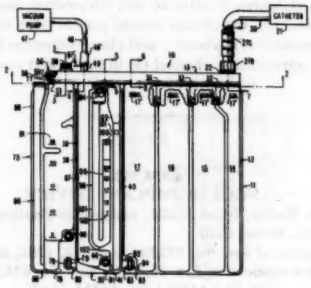
(e) valve means for occluding the liquid passageway means until substantially all of the secondary medication has been delivered from the chamber.

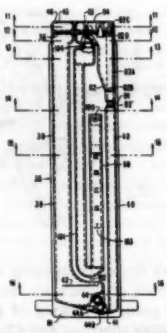
4,534,765

MODULAR DRAINAGE APPARATUS HAVING EXCESS NEGATIVITY CONTROL

Edward P. Todd, Lexington, Ky., and Eugene E. Weilbacher, New Philadelphia, Ohio, assignors to Snyder Laboratories, Inc., Dover, Ohio

Filed Jun. 8, 1982, Ser. No. 386,252
Int. Cl.³ A61M 1/00
U.S. Cl. 604—321 43 Claims





1. A modular drainage apparatus including:

three bodies;

support means to support each of said bodies;

said support means having two passage means;

a first of said bodies having a pressure regulating chamber communicating with one of said passage means;

a second of said bodies including a liquid seal chamber adapted to have a selected quantity of liquid therein, said liquid seal chamber having one end communicating with said one passage means to communicate with said pressure regulating chamber of said first body and said liquid seal

chamber having its other end communicating with the other of said passage means;

a third of said bodies having a collection chamber communicating with said other passage means to communicate with said other end of said liquid seal chamber of said second body;

said collection chamber having inlet means for connection to a pleural cavity of a body to receive fluids therefrom;

said one passage means including means to enable a negative pressure to be applied to said liquid seal chamber and said collection chamber and to remove gases from the fluids in said collection chamber to said liquid seal chamber;

said pressure regulating chamber of said first body controlling the negative pressure produced in said liquid seal chamber and said collection chamber;

and said second body including an excess negativity chamber having one end communicating with said other passage means and its other end continuously open and communicating with the atmosphere and adapted to have a selected quantity of liquid therein to limit the negative pressure within said collection chamber to a selected maximum above the negative pressure controlled by said pressure regulating chamber.

4,534,766

DRAINAGE BAG FOR URINE AND SUPPORT THEREFOR

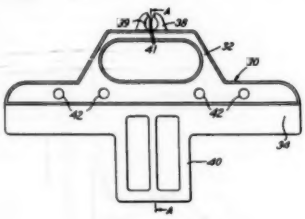
Peter L. Steer, and John V. Edwards, both of East Grinstead, England, assignors to Craig Medical Products Limited, East Grinstead, England

Filed Apr. 6, 1983, Ser. No. 482,669

Claims priority, application United Kingdom, Apr. 16, 1982, 8211103

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—323 **2 Claims**



1. A combined urine drainage bag and support therefor comprising:

(a) a bag having front and rear plastic walls with elongated top edges, said walls being welded together along their top edges in such a way as to define a plurality of reinforced, linearly-spaced through holes which do not communicate with the interior of said bag and which are capable of accepting hooks or studs on a hanger separate from said bag, an inlet tube in said top edges communicating with the interior of said bag and terminating in an anti-reflux valve within said bag; and

(b) separate support means having a transverse portion supporting linearly-spaced hooks, said hooks removably received in said holes of said bag, whereby a single support means can be simultaneously used with a plurality of bags, said support means characterized by an apertured tongue means located to extend downwardly behind or in front of said bag, said tongue having a downward extending length which is greater than the length of the transverse portion of said support means, whereby said tongue means prevents the flaps of an anti-reflux valve, from being kinked and so prevents said valve from becoming closed off should said bag be placed in a position where said flaps otherwise would have been folded or kinked.

4,534,767

PROTECTIVE SEALING COMPOSITION IN MOLDED FORM

Wagdi W. Habib, Roselle, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Continuation-in-part of Ser. No. 185,003, Sep. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 90,855, Nov. 2, 1979, abandoned. This application Jun. 10, 1981, Ser. No. 272,191

Int. Cl.³ A61F *5/44*

U.S. Cl. 604—336 **10 Claims**

1. A protective sealing composition in the form of a molded gelled ring, sheet, or the like, said composition comprising essentially a gelled mixture of gellable, water-absorbing, particulate hydrocolloid gum and a non-toxic liquid polyhydroxy alcohol, wherein the improvement comprises having dispersed in said composition an amount of fumed silica within the range from 0.1 to 4.0% by weight, said amount of fumed silica being effective to increase appreciably the mechanical endurance of said sealing composition when exposed to urine or intestinal fluid.

4,534,768

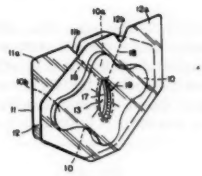
SEALANT PAD FOR EXTERNAL CATHETER AND METHOD OF USE THEREOF

Frank G. Osburn, Hanover Park, and Kenneth E. Riedel, Naperville, both of Ill., assignors to Hollister Incorporated, Libertyville, Ill.

Filed Jul. 12, 1982, Ser. No. 397,183

Int. Cl.³ A61F *5/44*

U.S. Cl. 604—350 **26 Claims**



12. A sealant pad combination for a male urinary incontinence device, comprising a thin planar pad having flat opposite surfaces and formed entirely of soft, pliable polymeric material having characteristics of stretchability, elastic recovery, surface tackiness, and stability upon exposure to urine; said pad having a flat oval-shaped ring portion with outer limits of generally elliptical shape and a pair of integral coplanar wing portions projecting radially outwardly from diametrically opposite sides of said ring portion beyond said outer limits thereof; said ring portion having an oval opening extending therethrough and oriented with its minor axis aligned in the direction of said wing portions; and a pair of thin, flexible release sheets covering said opposite surfaces of said pad; each of said release sheets having an outline substantially larger than said pad and being provided with an oval aperture in register with the opening in said pad; each release sheet having a line of separation extending from the perimeter thereof to a point along the edge of said aperture adjacent the intersection of said major axis with said edge, whereby, when said wing portions, covered by said release sheets, are gripped between the fingers of both hands and urged apart, the width of said oval opening of said pad and said oval apertures of said sheets increase in size and those stretches of said ring portion extending between said wing portions tend to flex towards each other.

4,534,769

DIAPER

Raphael De Jonckheere, Bondues, and Jacques Dussaud, La Madeleine, both of France, assignors to Boussac Saint Freres B.S.F., Lille, France

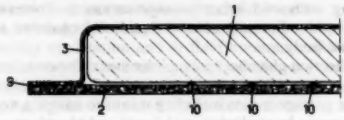
Filed Jun. 15, 1983, Ser. No. 504,413
Claims priority, application France, Jun. 24, 1982, 82 11107
Int. Cl.[3] A41B *13/02*
U.S. Cl. 604—369 28 Claims

1. A diaper, especially for infants, comprising

an outer sheet of plastic foam which is elastic and air-permeable but water-impermeable,

an inner sheet of plastic foam which is elastic, air-permeable, and water-permeable,

a water absorbent pad located between said outer sheet and said inner sheet, and



fastening means fixed on two opposite side margins of the diaper in order to close the diaper around the waist of the infant.

4,534,770

MULTI-RING FLUORINATED CARBAMATES WITH TEXTILES SOIL REPELLENT ACTIVITY

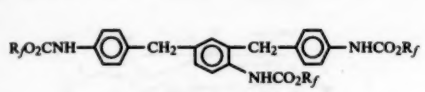
Michael G. Kelly, Coventry, R.I., assignor to American Hoechst Corporation, Sommerville, N.J.

Division of Ser. No. 507,407, Jun. 24, 1983, Pat. No. 4,500,438. This application Nov. 23, 1984, Ser. No. 674,398

Int. Cl.[3] D06M *13/40*; C07C *125/06*; C09B *67/00*

U.S. Cl. 8—115.6 4 Claims

1. A polyester or polyamide fiber having incorporated therewith a compound of the formula:



wherein R_f is a fluorinated radical of the formula $-W(C_nF_{2n})Y$ wherein W has from 1 to 10 carbon atoms and is selected from alkylene and $W'—Z—(W'')_b$ where W' and W'' are alkylene, Z is O, S, NHCO, or N (R)SO_2 wherein R is H or lower alkyl, and b is 0 or 1, Y is hydrogen, fluoro, or perfluoroalkoxy of 1 to 6 carbon atoms, and n is 2 to 20;

in an amount sufficient to impart oil or water repellency.

4,534,771

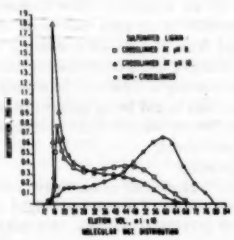
SELECTIVE CROSSLINKING OF LOW MOLECULAR WEIGHT SULFONATED LIGNINS AND LIGNOSULFATE PRODUCTS PRODUCED THEREBY

Peter Dilling, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 532,677, Sep. 16, 1983, abandoned. This application Mar. 21, 1984, Ser. No. 591,809

Int. Cl.[3] D06P *67/02*

U.S. Cl. 8—524 21 Claims



1. An improved dyestuff composition comprising a disperse or vat dye and a crosslinked sulfonated lignin dispersant prepared by the sequential steps of preparing a sulfonated lignin and crosslinking the sulfonated lignin by the addition of a crosslinking agent, wherein the improvement comprises crosslinking only the low molecular weight lignin fraction by maintaining the crosslinking reaction pH in the range from about 6.1 to below 9.

4,534,772

PROCESS OF ETHER SYNTHESIS

Eric H. Reichl, Greenwich, Conn., assignor to Conoco Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 372,507, Apr. 28, 1982, abandoned. This application Oct. 28, 1983, Ser. No. 546,233

Int. Cl.[3] C10L *1/02, 1/18*

U.S. Cl. 44—53 2 Claims

1. A process for producing a high octane liquid gasoline fuel product mixture rich in methanol and methyl ethers from coal consisting of the sequence of steps as follows:

(a) gasifying coal to form a coal gasification product gas mixture comprising hydrogen and carbon monoxide,

(b) contacting said coal gasification product gas with water and a shift conversion catalyst to catalytically react said water with said carbon monoxide of said gasification product gas to form a shift product gas mixture comprising carbon dioxide and hydrogen,

(c) subjecting said shift product gas mixture to a clean-up step to produce a cleaned shift product gas mixture,

(d) contacting said cleaned shift product gas mixture with an alcohol synthesis catalyst to form a synthesis product mixture of alcohols, said synthesis product mixture of alcohols comprising methanol, and said alcohol synthesis catalyst comprising alkali modified zinc oxide and chromium oxide,

(e) separating said synthesis product mixture of alcohols into a methyl alcohol separation product mixture and a higher alcohol separation product mixture, said methyl alcohol separation product mixture comprising a substantially larger proportion of methanol than said synthesis product mixture of alcohols, and said higher alcohol separation product mixture further comprising substantially all of the alcohols other than methanol from said synthesis product mixture of alcohols,

(f) dehydrating said higher alcohol separation product mixture with a catalyst to form a dehydration product mixture and water, said dehydration product mixture comprising olefins, and said catalyst comprising alumina,

(g) catalytically reacting said olefins of said dehydration product mixture with a portion of said methyl alcohol separation product mixture in the presence of an ether synthesis catalyst at about 125° F. and 300 psig to form a methyl ether product mixture, said ether synthesis catalyst comprising acidic ion exchange resin,

(h) mixing the remainder of said methyl alcohol separation product with said methyl ether product mixture to form a methyl alcohol and methyl ether product mixture as substantially the only liquid product of said coal gasified in step (a), and

(i) mixing gasoline with said methyl alcohol and methyl ether product mixture to form a high octane fuel product, whereby substantially all of the alcohols formed in step (d) are formed into a mixture of methyl alcohol and methyl ethers and are mixed with gasoline to produce a high octane liquid gasoline fuel product rich in methyl alcohol and methyl ethers.

4,534,773

ABRASIVE PRODUCT AND METHOD FOR MANUFACTURING

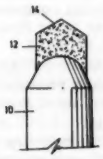
Cornelius Phaal, 34 Rutland Ave., Craighall Park, Johannesburg, Transvaal; Noel J. Pipkin, 115 Pritchard St., Johannesburg North, Randburg, Transvaal, and Richard P. Burnand, 39 Constantia Ave., Alan Manor, Johannesburg, Transvaal, all of South Africa

Filed Dec. 29, 1983, Ser. No. 566,862

Claims priority, application South Africa, Jan. 10, 1983, 83/0139; Feb. 4, 1983, 83/0754

Int. Cl.[3] B24D *3/00*

U.S. Cl. 51—293 9 Claims



1. An abrasive body comprising a mass of diamond particles present in an amount of 80 to 90 percent by volume of the body

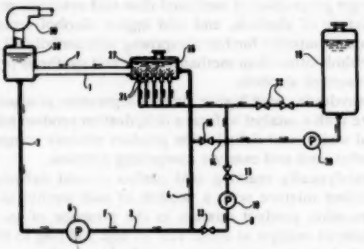
and a second phase present in an amount of 10 to 20 percent by volume of the body, the mass of diamond particles containing substantial diamond-to-diamond bonding to form a coherent skeletal mass and the second phase containing nickel and silicon. the nickel being in the form of nickel and/or nickel silicide and the silicon being in the form of silicon, silicon carbide, and/or nickel silicide.

4,534,774

METHOD OF DEGASSING A LIQUID

Yves Lecoffre, Le Versoud, and Jean Marcoz, Grenoble, both of France, assignors to Societe anonyme dite: Alsthom-Atlantique, Paris, France

Filed Aug. 24, 1984, Ser. No. 643,937
Claims priority, application France, Aug. 26, 1983, 83 13780
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—44 **3 Claims**



1. A method of degassing a liquid, the method being applicable to a liquid containing an unwanted gas in solution and serving to reduce the concentration of the gas to final concentration below its initial concentration, said method comprising the steps of:

effecting mass exchange at reduced pressure during which the liquid is to be degassed by placing said liquid in a free separation enclosure, and

aspirating the gaseous medium above the liquid to reduce the pressure of the unwanted gas to a degassing value below its saturation pressure which corresponds to the desired final concentration, and

maintaining said degassing pressure for the time required to obtain the desired final pressure by mass exchange through the interface between the liquid and the gas phases,

injecting bubbles of said unwanted gas itself into the undegassed liquid to thereby increase the area of the interface between the liquid and gas phases during the reduced pressure exchange operation, thereby accelerating mass exchange,

the improvement wherein said step of injecting microbubbles comprising injecting microbubbles of a diameter substantially in the range of about 50 micrometers to about 100 micrometers under a condition of a small rate of gas injection whereby said bubbles initially rise slowly through the liquid and create a large interface area,

wherein said method is applicable to a liquid circulating in a closed circuit and further comprises the following steps:

taking a fraction of said liquid flow, said fraction being a fraction for injection;

pressurizing said fraction to an injection pressure greater than twice the degassing pressure;

taking a fraction of said liquid flow, said fraction being a fraction for engassing;

engassing the fraction for engassing in an engassing enclosure which is supplied with said unwanted gas and which is subjected to an engassing pressure greater than the injection pressure, thereby dissolving the gas in a liquid to a concentration which is greater than twice the initial concentration; and

transforming said fraction into a superengassed fraction; and

progressively and adjustably relaxing the superengassed fraction to mix it in adjustable proportions with the injection fraction and thus to supply an injection mixture having a substantially constant injection concentration of said unwanted gas;

with said step of injecting bubbles into said liquid taking place through injection holes supplied with the injection mixture and leading to said liquid substantially at the degassing pressure.

4,534,775

AIR TREATMENT FILTER ELEMENT AND AIR TREATMENT FILTER

Stephen E. Frazier, Orlando, Fla., assignor to General Time Corp., Norcross, Ga.

Continuation of Ser. No. 354,030, Mar. 2, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 601,946
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—74 **40 Claims**

1. A method for removing odors and harmful gases from indoor air which comprises contacting the air, odors and harmful gases with an air treatment filter element, said element consisting essentially of at least one layer of an adsorbent material selected from the group consisting of zeolite, activated carbon, silica gel, and a combination thereof, said adsorbent material containing a liquid for inhibiting the growth of microorganisms, said liquid being present in an amount from about 5 to about 50% by weight of the combined weight of said adsorbent and said liquid;

said liquid comprising:

(a) a fungicide/bacteriocide preservative composition in an amount from about 0.5 to 2% by weight of the liquid;

(b) at least one polyhydric alcohol, said polyhydric alcohol being present in an amount from about 83 to 99.5% by weight of the liquid; and

(c) at least one compound for modifying the vapor pressure of said polyhydric alcohol, said compound being present in an amount of less than about 15% by weight of the liquid.

12. An air treatment filter element consisting essentially of an adsorbent material selected from the group consisting of zeolite, activated carbon and a combination thereof, said adsorbent material containing a liquid for inhibiting the growth of microorganisms, said liquid comprising:

(a) a fungicide/bacteriocide preservative composition in an amount from about 0.5 to 2% by weight of the liquid,

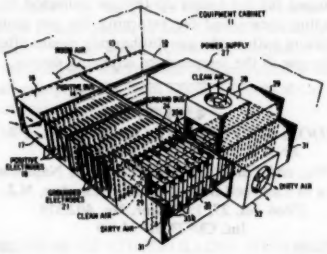
(b) at least one polyhydric alcohol, said polyhydric alcohol being present in an amount from about 83 to 99.5% by weight of the liquid, and

(c) at least one additional compound for modifying the vapor pressure of said polyhydric alcohol, said additional compound being present in an amount from about 0 to 15% by weight of the liquid, said liquid being present in an amount from about 5 to about 50% by weight of the combined weight of said adsorbent and said liquid.

4,534,776
AIR CLEANER

Lewis H. Mammel, Holmdel, and Walter J. Shakespeare, Middletown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 408,218, Aug. 16, 1982, abandoned.
This application Jul. 30, 1984, Ser. No. 635,895
Int. Cl.[3] B03C *3/00*
U.S. Cl. 55—136 6 Claims



1. Apparatus for providing air to an enclosure located within a room, said apparatus comprising

a housing,

means within said housing adapted to be in communication with said room for creating a stream of air taken from said room, said stream being laden with dust,

means within said housing for moving dust that is in at least a first longitudinal region of said air stream transversely to the direction of flow of said air stream into at least a second longitudinal region of said air stream, said second region being contiguous in said air stream to said first region, said dust moving means comprising first and second interleaved pluralities of rows of electrodes disposed in said first and second regions, respectively, and means for connecting the electrodes of said first and second pluralities to respective electrical potentials,

baffle means within said housing for separating said first and second regions to form streams of clean and dirty air, respectively, said dirty stream being more laden with dust than said clean stream and said baffle means having formed therein at least first and second channels aligned with said first and second regions, respectively, and

output means for directing said clean air into said enclosure and for discharging into said room said dirty air and substantially all of said dust that is not in said clean stream.

4,534,777
GAS SEPARATION APPARATUS

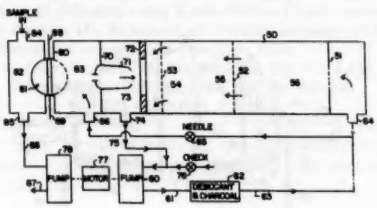
Bruce W. Castleman, Kenneth City; David P. McQuire, Dade City, and Eugene L. Szonntagh, Largo, all of Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1984, Ser. No. 626,811
Int. Cl.[3] B01D *53/06*
U.S. Cl. 55—181 4 Claims

1. In combination:

a housing defining sorption and desorption chambers separated by a partition having an aperture which is bilaterally symmetrical about an axis;

and sorption means comprising a plate, pivotally mounted in said aperture for rotation about said axis through first and second positions in which it substantially occludes said aperture, and a plurality of generally semicircular, mutually spaced sorption wafers mounted on one face of said plate and generally orthogonal to said axis, so that in said first position of said plate said wafers are in said sorption

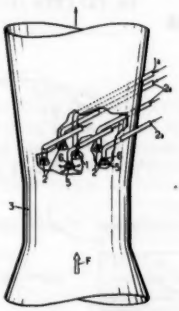


chamber, while in said second position of said plate said wafers are in said desorption chamber.

4,534,778
INSTALLATION FOR INJECTING A POWDERY MATERIAL, PARTICULARLY AN ADSORBENT MATERIAL, INTO A CONTACT COLUMN

Christian Carré , Houilles, and Jean P. Guibet, Dormont St. Pierre de Bailleul, both of France, assignors to Air Industrie, Courbevoie, France

Filed Oct. 14, 1983, Ser. No. 542,058
Claims priority, application France, Oct. 25, 1982, 82 17826
Int. Cl.[3] B01D *53/06*
U.S. Cl. 55—340 9 Claims



1. An installation for injecting an adsorbent powdery material into a generally vertical contact column having a lateral wall, through which column flows a stream of gas laden with polluting effluents which it is desired to fix on said material, said installation comprising means opening into the column for injecting fresh material and for injecting recycled material already having served the same purpose, said injecting means comprising a plurality of nozzles for injecting recycled material spaced apart about at least one nozzle for injecting fresh material, said plurality of nozzles and said at least one nozzle being disposed in said column.

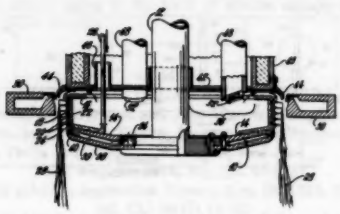
4,534,779
METHOD AND APPARATUS FOR HEATING A MINERAL FIBER FORMING SPINNER

Max G. Herschler, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 452,272, Dec. 22, 1982, abandoned. This application Aug. 16, 1984, Ser. No. 641,248
Int. Cl.[3] C03B *37/04*
U.S. Cl. 65—6 10 Claims

9. A method for fiberizing molten mineral material comprising supplying molten mineral material to a rotating spinner,

centrifuging the molten mineral material into mineral fibers by passing the molten mineral material through the orificed peripheral wall of said spinner, directing hot gases toward the interior of said peripheral wall, venting the hot gases from said



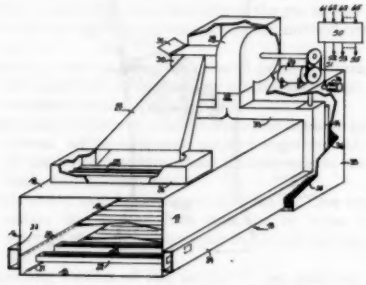
spinner, deflecting the vented hot gases radially outwardly toward said peripheral wall, and changing the direction of the vented hot gases so that they flow along the exterior of said peripheral wall in the absence of external heating means.

4,534,780

APPARATUS FOR HEAT TREATMENT OF OBJECTS BY CONVECTION

Hans Cemin, Fullingsdorf, Switzerland, assignor to Societe d'Etudes et Installations Industrielles CNUD S.A., Brussels, Belgium

Filed Mar. 15, 1983, Ser. No. 475,549
Claims priority, application France, Mar. 25, 1982, 82 05087
Int. Cl.³ C03B *25/06*
U.S. Cl. 65—348 **21 Claims**



21. A modular section for use in a generally horizontal tunnel furnace for heat treatment by convection of separate bodies of hollow glass, the furnace being formed by assembly of juxtaposed modular sections, each module having an exterior, an upper wall, and sides, the assembly forming a heat treatment enclosure having a width, the tunnel furnace comprising a conveyor with a horizontal belt disposed in the enclosure causing said bodies to travel in a direction through the tunnel furnace, a circulation system comprising a gas circulating loop for creating a circulation of gas, transverse to the movement of the belt and between the bodies to be treated, and a system for maintaining temperatures of the gas in each modular section such that gas temperatures in the modular sections are individually regulated to a desired value in each of the successive sections, the modular section comprising:

gas discharging means comprising a plurality of horizontal and mutually parallel flues each defining an opening substantially occupying the width of the heat treatment enclosure beneath the conveyor, each flue being oriented in a direction perpendicular to the direction of travel of the conveyor, such that a sheet of ascending gas is produced from the opening;

gas collecting means comprising at least one horizontal collecting flue defining an opening formed in the upper wall substantially occupying the entire width of the heat treatment enclosure, the collecting flue being oriented in a direction perpendicular to the direction of travel of the conveyor, such that the collecting flue collects the sheets of ascending gas;

at least one temperature adjusting device for adjusting the temperature of the collected gas to the temperature desired in the heat treatment enclosure of the modular section; and

a circulating fan for taking up the gas collected by the gas collecting means and for returning the gas along a gas circulating path to the gas discharging means after exposing the gas to the temperature adjusting device.

4,534,781

MUSHROOM SUPPLEMENT CONTAINING PROTEIN AND A TIME DELAY COATING

Lung-chi Wu, and Carl W. Bretzloff, both of Napoleon, Ohio, assignors to Campbell Soup Company, Camden, N.J.

Filed Jul. 27, 1982, Ser. No. 402,314
Int. Cl.³ C05F *11/00*
U.S. Cl. 71—5 **20 Claims**

1. An improved nutrient supplement for enhancing the growth of mushroom mycelium in a compost bed comprising a particulate primarily non-denatured protein-containing nutrient supplement having a coating of a hydrophobic material that is not readily assimilable by competing microorganisms in the compost, which coating delays the availability of the nutrient to the mushroom mycelium while said coating is gradually removed under the conditions of mushroom growth.

4,534,782

METHOD FOR INCREASING THE BIOLOGICAL VALUE OF MANURES, DUNG-WATERS, ORGANIC WASTES AND/OR SOILS RICH IN LYSINE

István Rusznák; Lajos Trézl, both of Budapest; Dezsö Földesi, Budakalász-felsö; Béla Szabó, Tiszaföldvár; Imre Bódi, Tiszaföldvár; Szilveszter Császár, Tiszaföldvár; Mihály Szopko, Szeged; Mihály Gombár, Tiszaföldvár; Gabriella Kovács, and Ernö Tyihák, both of Budapest, all of Hungary, assignors to Magyar Tudományos Akadémia Központi Hivatala, Budapest and Lenin Mezögazdasági Termelöszövetkezet, Tiszaföldvár, both of, Hungary

Filed Oct. 6, 1981, Ser. No. 309,224
Claims priority, application Hungary, Aug. 10, 1980, 2447/80
Int. Cl.³ C05F *3/00*
U.S. Cl. 71—21 **11 Claims**

1. A method of increasing the biological value of soils which comprises: applying to soil that is to be used to support crop growth a methylated lysine derivative that is formed by treating a lysine source with at least 0.01 mole of formaldehyde or an equivalent amount of a formaldehyde source, calculated for one mole of free or bound lysine that is present, at a pH of from 1 to 13.

4,534,783

HIGH CONCENTRATION ENCAPSULATION OF WATER SOLUBLE-MATERIALS

George B. Beestman, St. Louis County, Mo., assignor to Monsanto Co., St. Louis, Mo.

Filed Jan. 3, 1984, Ser. No. 567,585
Int. Cl.³ B01J *13/02*
U.S. Cl. 71—27 **19 Claims**

1. A process of encapsulating a water-soluble material within a shell wall of polymeric materials which comprises:

(a) providing an organic continuous phase liquid containing an oil soluble alkylated polyvinylpyrrolidone emulsifier;

(b) dispersing in said continuous phase liquid an aqueous discontinuous phase liquid containing a first shell wall component and a water-soluble material dissolved therein

to form a dispersion of discontinuous phase droplets throughout the continuous phase;

(c) adding with agitation to said dispersion a second shell wall component, whereby said second shell wall component reacts with said first shell wall component to form a polymeric shell wall about said discontinuous phase droplet;

wherein the concentration of said water-soluble material is from about 480 grams to about 700 grams per liter of composition; wherein the concentration of said emulsifier is from 0.5% to about 15.0% by weight of said water-soluble material; wherein the concentration of said first shell wall component is from about 1.5% to about 10.0% by weight of said water soluble material and wherein the concentration of said second shell wall component is from about 3.5% to about 20.0% by weight of said water-soluble material.

4,534,784

METHOD OF CONTROLLING WEED PESTS

James L. Ahle, San Jose, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 6, 1984, Ser. No. 638,078
Int. Cl.³ A01N *57/10*
U.S. Cl. 71—87 **6 Claims**

1. A method for the pre-emergent control of undesirable grass weed pests which comprises applying to the locus where control is desired by pre-emergent application of a herbicidally effective amount of the trimethylsulfonium salt of N-phosphonomethylglycine, said salt being applied at a rate of at least about four pounds per acre.

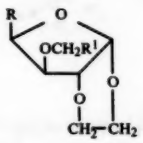
4,534,785

HERBICIDAL 5-DEOXY-3-O-ARYLMETHYL OR SUBSTITUTED ARYLMETHYL-1,2-O-ETHYLENE-ALPHA-D-XYLOFURANOSE DERIVATIVES

William Loh, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 15, 1984, Ser. No. 589,815
Int. Cl.³ A01N *43/08*; C07H *17/04*
U.S. Cl. 71—88 **21 Claims**

1. A compound having the formula:



(I)

wherein

R is linear lower alkyl having 1 through 4 carbon atoms or linear alkenyl having 2 through 4 carbon atoms;

R^1 is 2-trifluoromethylphenyl, aryl having 6 through 10 carbon atoms or substituted aryl having 1 through 4 substituents independently selected from the group of lower alkyl having 1 through 4 carbon atoms, lower alkoxy having 1 through 4 carbon atoms, cyano and halo.

17. A method for controlling undesired vegetation which comprises supplying a herbicidally effective amount of the compound of claim 1 or mixtures thereof, to the foliage or growth medium of said vegetation.

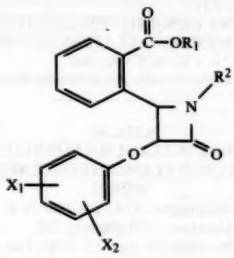
4,534,786

1-ALKYL DERIVATIVES OF 3-ARYLOXY-4-(2-CARBALKOXY)-PHENYL-AZET-2-ONES AS PLANT GROWTH REGULATORS

Tatao Luo, El Sobrante; Louis Russo, Walnut Creek, and Francis J. Freenor, III, Richmond, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 391,798, Jun. 23, 1982, Pat. No. 4,443,372.
This application Apr. 13, 1984, Ser. No. 600,260
Int. Cl.³ A01N *43/44*
U.S. Cl. 71—88 **24 Claims**

1. A plant growth regulating composition comprising a biologically inert carrier and a plant growth regulating effective amount of a compound of the formula:



wherein R_1 is methyl or ethyl; R_2 is lower alkyl; and X_1 and X_2 are independently hydrogen or halogen.

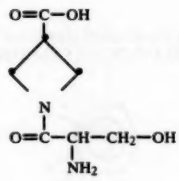
4,534,787

N-L-SERYL-3-AZETIDINECARBOXYLIC ACID

Gary M. Gardner, Manteca, and J. Edward Semple, Modesto, both of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed May 24, 1984, Ser. No. 613,496
Int. Cl.³ C07D *205/04*; A01N *43/44*
U.S. Cl. 71—88 **5 Claims**

1. A compound of the formula:



2. A method for sterilizing the male parts of a wheat plant, which comprises applying to the plant prior to pollen shed an effective dosage of the compound of claim 1.

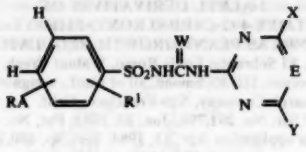
4,534,788

HERBICIDAL SULFONAMIDES

John B. Adams, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 152,021, May 30, 1980, Pat. No. 4,452,628, which is a continuation-in-part of Ser. No. 60,869, Jul. 26, 1979, abandoned. This application Nov. 15, 1983, Ser. No. 538,261
Int. Cl.³ A01N *47/36*; C07D *239/42*
U.S. Cl. 71—92 **24 Claims**

1. A compound selected from



wherein
W is O or S;
R is CHF_2, CF_3, CH_2CF_3 or CF_2CHFG, where G is F, Cl, CF_3 or Br;
A is O or $S(O)_n$, where n is 0, 1 or 2;
R^1 is H, F, Cl, Br or CH_3;
X is CH_3 or OCH_3;
Y is CH_3, OCH_3, OCH_2CH_3, $(CH_2)_mOCH_3$ (where m is 1 or 2), $OCH_2CH_2OCH_3$, or $OCHR^2CO_2R^3$, where R^2 is H or CH_3 and R^3 is CH_3 or C_2H_5; and
E is CH and agriculturally suitable salts thereof.

4,534,789

HERBICIDAL O-ALKYLSULFONYLOXY- AND O-ALKYLSULFONYLAMINOBENZENESULFONAMIDES

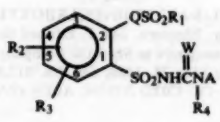
James J. Reap, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 368,809, Apr. 15, 1983, Pat. No. 4,435,205, which is a continuation-in-part of Ser. No. 262,813, May 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 168,344, Jul. 11, 1980, abandoned. This application Oct. 21, 1983, Ser. No. 544,429

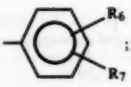
Int. Cl.[3] **C07D** *251/46, 251/52, 251/18;* **A01N** *43/70*

U.S. Cl. 71—93 **25 Claims**

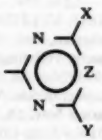
1. A compound of the formula



where
W is O or S;
Q is O or NR_5;
R_1 is C_1–C_4 alkyl, C_1–C_4 alkyl substituted with 1–3 atoms of F, Cl or Br, $CH_2CH_2OCH_3$, $CH_2CH_2CH_2OCH_3$ or



R_2 is H, F, Cl, Br, OCH_3, NO_2, CF_3 or C_1–C_2 alkyl;
R_3 is H, F, Cl, Br or CH_3;
R_4 is H, CH_3 or OCH_3;
R_5 is C_1–C_4 alkyl;
R_6 and R_7 are independently H, F, Cl, Br, CH_3, CF_3, NO_2 or OCH_3;
A is



X is NH_2, $N(CH_3)_2$, $NHCH_3$, C_1–C_4 alkyl, C_1–C_4 alkyl substituted with 1–3 atoms of F, Cl or Br, CH_2OCH_3, $CH_2OCH_2CH_3$, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, $OCH_2CH_2OCH_3$ or C_2–C_4 alkoxy substituted with 1–3 atoms of F, Cl or Br;
n is 1 or 2;
Y is CH_3 or OCH_3; and
Z is N;
provided that
(1) when W is S, then R_4 is H; and
(2) when R_4 is OCH_3, then Q is O.

15. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,534,790

HERBICIDAL SULFONAMIDES

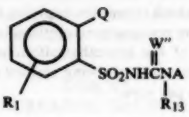
Anthony D. Wolf, Elkton, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 428,806, Oct. 7, 1982, Pat. No. 4,465,505, which is a continuation-in-part of Ser. No. 337,932, Jan. 7, 1982, abandoned. This application Jul. 12, 1984, Ser. No. 630,222

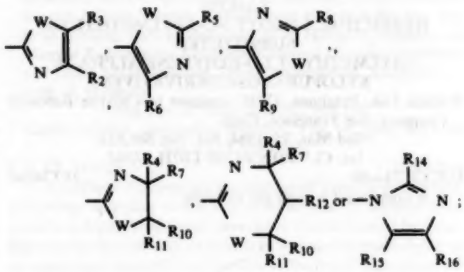
Int. Cl.[3] **C07D** *403/12, 413/12;* **A01N** *43/70, 43/66*

U.S. Cl. 71—93 **32 Claims**

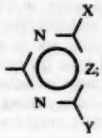
1. A compound of the formula:



where
Q is



W" is O or S;
W is O, S, or NR;
R is H or C_1–C_4 alkyl;
R_1 is H, F, Cl, Br, CH_3, CF_3 or OCH_3;
R_2 is H, CH_3, C_2H_5, OCH_3, OC_2H_5, SCH_3, Cl or Br;
R_3 is H, CH_3, C_2H_5, OCH_3, OC_2H_5, SCH_3, Cl or Br;
R_5 is H, CH_3, C_2H_5, OCH_3, OC_2H_5, SCH_3, Cl or Br;
R_6 is H, CH_3 or C_2H_5;
R_8 is H, CH_3, C_2H_5, OCH_3, OC_2H_5, SCH_3, Cl or Br;
R_9 is H, CH_3 or C_2H_5;
R_4, R_7, R_{10} and R_{11} are independently H or C_1–C_4 alkyl;
R_{12} is H or CH_3;
R_{13} is H or CH_3;
R_{14} is H, CH_3, C_2H_5, Cl, Br, CH_3O, C_2H_5O or CH_3S;
R_{15} is H, CH_3 or C_2H_5;
R_{16} is H, CH_3 or C_2H_5;
A is



X is CH_3, or OCH_3;

Y is CH_3, C_2H_5, CH_2OCH_3, OCH_3, OC_2H_5, $CH(OCH_3)_2$, NH_2, $NHCH_3$, $N(CH_3)_2$, $OCH_2CH_2OCH_3$, OCH_2CF_3, CF_3, SCH_3 or

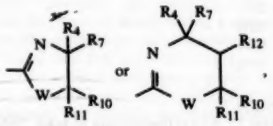
Z is N;

and their agriculturally suitable salts; provided that

(a) when R_8 is other than H, CH_3, C_2H_5 or CH_3S, then W is S or O;

(b) the total number of carbon atoms of R_4, R_7, R_{10} and R_{11} is less than or equal to 4;

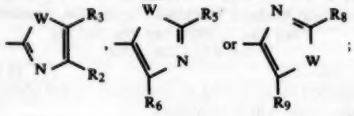
(c) when Q is



then R_{13} is H, R is other than H, X is OCH_3 and Y is OCH_3 or OC_2H_5; and

(d) when W'' is S, then R_{13} is H;

Q is



and

Y is CH_3, OCH_3, C_2H_5, OC_2H_5, CH_2OCH_3, $CH(OCH_3)_2$ or

25. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,534,791

PROCESS FOR TREATING SILICON AND FERROSILICON WITH SLAG

Anton More, Burghausen, Fed. Rep. of Germany; Winfried Lang, Ach, Austria; Rudolf Riedle, Burghausen, Fed. Rep. of Germany; Herbert Straussberger, and Willi Streckel, both of Mehring-Öd, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 30, 1984, Ser. No. 635,794

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1983, 3331046

Int. Cl.³ C22B *4/00*

U.S. Cl. 75—10 R **1 Claim**

1. The process for treating silicon or ferrosilicon with a slag that is liquefied and kept in a molten state by means of electrical resistance heating, comprising the step of bringing at least one of said silicon and ferrosilicon into contact with a slag having the following analytical composition:

K_2O	from 2 to 13% by weight
Na_2O	from 0 to 2% by weight
Σ K_2O + Na_2O	from 2 to 13% by weight
SiO_2	from 45 to 72% by weight
Al_2O_3	from 0 to 30% by weight
Σ SiO_2 + Al_2O_3	from 60 to 78% by weight
CaO	from 0 to 30% by weight
MgO	from 0 to 30% by weight
Σ CaO + MgO	from 15 to 30% by weight
CaF_2	from 0 to 10% by weight
MgF_2	from 0 to 10% by weight
Σ CaF_2 + MgF_2	from 0 to 10% by weight
Σ CaO + MgO + CaF_2 + MgF_2	from 15 to 30 % by weight

and impurities resulting from the raw materials.

4,534,792

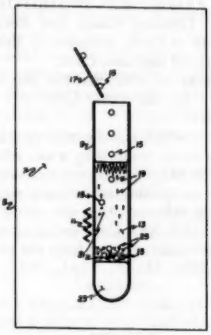
MAGNESIUM REDUCTION OF URANIUM OXIDE

Guy R. B. Elliott, 133 La Senda Rd., Los Alamos, N. Mex. 87544

Filed Jan. 27, 1983, Ser. No. 446,762

Int. Cl.³ C22B *5/00, 60/02*

U.S. Cl. 75—84.1 R **15 Claims**



1. A method of reacting uranium oxide with magnesium to produce uranium comprising:

(a) holding in a container, a molten-salt solution comprising halides of lanthanides, strontium, and/or barium and having a density greater than 3.4 grams per cubic centimeter,

(b) adding solid uranium oxide to the said molten-salt solution, thereby placing the said molten-salt solution in contact with the said solid uranium oxide,

(c) adding magnesium to the said molten-salt solution,

(d) dissolving at least some of the said magnesium into the said molten-salt solution,

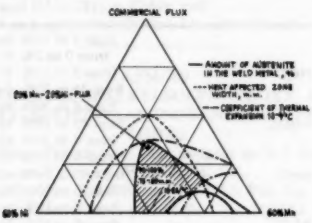
(e) reacting the said magnesium and the said uranium oxide, thereby forming magnesium oxide and uranium,
(f) separating by density differences the said uranium and the said magnesium oxide in the said molten-salt solution, and
(g) removing separately the said uranium and the said magnesium-oxide from the said molten-salt solution.

4,534,793

CAST IRON WELDING MATERIALS AND METHOD

David L. Olson, Golden, Colo., and Alfredo D. Marquez, Caracas, Venezuela, assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 77,038, Sep. 19, 1979, abandoned. This application Nov. 16, 1982, Ser. No. 442,172
Int. Cl.³ B23K *35/22*
U.S. Cl. 75—123 N **16 Claims**


COMMERCIAL FLUX
AMOUNT OF AUSTENITE IN THE WELD METAL, %
HEAT AFFECTED ZONE WIDTH, m.m.
COEFFICIENT OF THERMAL EXPANSION 10⁻⁶/°C
50% Ni - 25% Cr - FLUX
50% Ni
50% Mn

1. A welding composition for use in the submerged arc welded of cast iron, said composition consisting essentially of a mixture of nickel, manganese and flux delineated by the cross-hatched area of FIG. 9 in the drawings, said composition, when used with an iron welding wire producing a cast iron weldment having an improved coefficient of thermal expansion ranging from $(15 \text{ to } 20)\times 10^{-6}$/°C. at 850° C. and a fusion zone wherein 1% to 10% of the weld metal matrix is discontinuous carbides.

4,534,794

SALT CORROSION INHIBITORS

Robert J. Walter, Thousand Oaks, and Bernard J. Gerik, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 14, 1981, Ser. No. 263,646
Int. Cl.³ C09D *5/18*
U.S. Cl. 106—14.05 **1 Claim**

1. The salt system which significantly retards corrosion of mild and low alloy steels comprising a salt selected from the group consisting of KNO_3, $NaNO_3$ and mixtures thereof and a corrosion inhibitor comprising an intimate mixture of a low valence metal oxide selected from the group consisting of Li_2O, Na_2O, CuO, MgO, NiO, CaO, and mixtures thereof, and a high valence metal oxide selected from the group consisting of Al_2O_3, Cr_2O_3, SiO_2, Mn_3O_4, Ti_2O_3, Y_2O_3, and mixtures thereof.

4,534,795

LONG SHELF LIFE CEMENTITIOUS ANCHORING CAPSULE

Christopher G. Lewis, 27 Dunster Ct., Furzton, Milton Keynes, Buckinghamshire, England (MK4 1DG), and Patrick Martin, 26 The Orchard, Fen Drayton, Cambridgeshire, England (CB4 5SN)

Filed Dec. 28, 1983, Ser. No. 566,131
Claims priority, application United Kingdom, Jan. 5, 1983, 8300166
Int. Cl.³ C04B *7/35*; E21D *20/02*
U.S. Cl. 106—89 **12 Claims**

1. A frangible anchoring capsule containing in separate compartments an interactive base and catalyst component of a self-setting cementitious composition, the base component comprising a cement and water, and the catalyst component comprising a catalyst and water, in which
(i) the base component includes cement particles coated with a water insoluble coating and an additive to complex any calcium ion released from the cement into solution, and
(ii) the catalyst component includes a material which will interact with the insoluble coating to release cement particles to allow self-setting to take place.

11. A self setting composition comprising a cement base and a catalyst thereof, in which the cement base component comprises cement particles coated with a water insoluble coating and including an additive to complex any calcium ion released from the cement into solution, and in that the catalyst component therefor includes a material which will interact with the insoluble coating to release cement particles to allow self setting to take place when the cement and catalyst are mixed.

4,534,796

GLASS FIBERS FOR THE REINFORCEMENT OF CEMENT

Jean-Jacques Massol, Asnieres, France, assignor to Isover Saint-Gobain, Neuilly-sur-Seine, France

Continuation of Ser. No. 115,679, Jan. 28, 1980, abandoned. This application Oct. 1, 1981, Ser. No. 307,448
Claims priority, application France, Jan. 30, 1979, 79 02276
Int. Cl.³ C04B *7/02, 31/06*
U.S. Cl. 106—99 **5 Claims**

1. Composite products made up of cement reinforced by the glass fibers comprising, in percentages by weight:
SiO_2: 25 to 54%
Al_2O_3: 20 to 40%
MgO: 24 to 40%
ZrO_2: 1 to 5%
P_2O_5: 0 to 10%
TiO_2: 0 to 10%
B_2O_3: 0 to 10%
F: 0 to 5%
Cr_2O_3: 0 to 2%
the sum of $2MgO+Al_2O_3$ comprising at least 70% of the total weight.

4,534,797

METHOD FOR PROVIDING AN ELECTROLESS COPPER PLATING BATH IN THE TAKE MODE

David E. King, Endicott; Voya Markovich, Endwell; Carlos J. Sambucetti, Croton-on-Hudson; Stephen L. Tisdale, and Donna J. Trevitt, both of Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1984, Ser. No. 567,723
Int. Cl.³ C23C *3/02*
U.S. Cl. 106—1.23 **18 Claims**

1. A method for providing an electroless copper plating bath in the take mode which comprises:
A. determining the amount in said bath of at least four of the components selected from the group of dissolved oxygen, reducing agent selected from the group of formaldehyde, formaldehyde precursors, formaldehyde homopolymers, and mixtures thereof, cyanide ion, cupric ion, and complexing agent;
B. solving the following equation:

$$R=(CABD)/E$$

wherein
C=concentration of cupric salt in g/l, calculated as $CuSO_4.5H_2O$
A=concentration of reducing agent in g/l
B=concentration of O_2, ppm
D=concentration of cyanide ion in mg/l, calculated as NaCN

E=concentration of complexing agent in g/l

C. providing the bath with quantities of said oxygen, reducing agent, cyanide ion source, cupric ion source, and complexing agent so that R, in said equation, is between about 5 and about 15 $(g.ppm.mg/(liter)^2$ and wherein the amount of said dissolved oxygen is about 0.5–2.0 ppm; amount of said reducing agent is about 2.0–2.5 ml/l calculated as formaldehyde; the amount of said cyanide salt is about 10 to about 12 mg/l, calculated as sodium cyanide; the amount of said cupric salt is about 8.5 to 10 g/l calculated as $CuSO_4.5H_2O$, and the amount of said complexing agent is about 38 to 45 g/l.

4,534,798

COMPOSITION FOR PARTITIONING BLOOD COMPONENTS

Seiichirou Honda, Takarazuka; Hiroshi Ogawara, Ohtsu, and Mutsumi Fukuda, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 292,029, Aug. 11, 1981, Pat. No. 4,457,782. This application Nov. 18, 1983, Ser. No. 553,187

Claims priority, application Japan, Aug. 18, 1980, 55-113811; Aug. 28, 1980, 55-119397; May 29, 1981, 56-83050

Int. Cl.³ C08L *91/00*; B01D *12/00*

U.S. Cl. 106—266 **6 Claims**

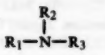
1. A blood-partitioning composition consisting essentially of a mixture of

(1) a thixotropy-imparting agent which is an inorganic solid powder having an average particle diameter of from 1 to 1,000 millimicrons, a specific surface area of at least 10 m^2/g and a specific gravity in the range of from 1.5 to 3.0;

(2) a first viscous liquid material having strong interaction with the thixotropy-imparting agent such that when the thixotropy-imparting agent is uniformly dispersed with the first viscous liquid and then centrifuged, no localization of said thixotropic agent occurs in the centrifuged liquid, said first viscous liquid having a viscosity at 20° C. of at least 200 centripoises and a specific gravity at 20° of from 0.9 to 1.2, said first material being a natural animal or vegetable oil modified with epoxy groups or a synthetic polymeric material containing carbonyl or epoxy groups in the molecule, and wherein said first material is liquid at room temperature;

(3) a second viscous liquid material having no strong interaction with the thixotropy-imparting agent such that when the thixotropy-imparting agent is uniformly dispersed with the second viscous liquid material and then centrifuged, the thixotropy-imparting agent is localized in said second viscous liquid, said second viscous liquid having good compatibility with the first viscous liquid material such that no substantial phase separation occurs upon mixing the two liquids, said second liquid material having a viscosity at 20° C. of at least 1,000 centipoises and a specific gravity at 20° C. of 0.85 to 1.20 and being a high-molecular-weight material liquid at room temperature composed substantially only of carbon and hydrogen or a high-molecular-weight material liquid at room temperature composed substantially of carbon, hydrogen and chlorine; and

(4) (a) at least one water-insoluble amine(;) of the following formula:



wherein R_1, R_2 and R_3 each represent a hydrogen atom or an alkyl group, provided that at least one of R_1, R_2 and R_3 is a higher alkyl group containing at least 8 carbon atoms, which alkyl group may be substituted with one polyoxyalkylene group;

said composition having a specific gravity at 20° C. of from 1.03 to 1.08, a viscosity at a shearing speed of 1 sec^{-1} of from 60,000 to 400,000 centipoises and a thixotropy coefficient of at least 1.8, the amount of said thixotropy-imparting agent being from 2 to 30 parts by weight per 100 parts by the combined weight of the first and second viscous liquid material, and the amount of said second viscous liquid material being from 20 to 600 parts by weight per 100 parts by weight of the first viscous liquid material.

4,534,799

PROCESSING AIDS FOR NATURAL AND SYNTHETIC RUBBER

Juan E. Aguirre, Hackensack, N.J., assignor to Technical Processing Inc., Paterson, N.J.

Filed Sep. 5, 1984, Ser. No. 647,479

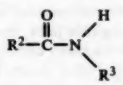
Int. Cl.³ C08L *91/00*; C08K *9/04*

U.S. Cl. 106—270 **9 Claims**

1. A partially-neutralized, fatty-acid modified alkylbenzene sulfonic acid useful as a rubber processing aid produced by heating at an elevated temperature an alkylbenzene sulfonic acid whose alkyl group contains from about 10 to about 14 carbon atoms with a saturated or unsaturated long chain fatty acid having from about 14 to about 20 carbon atoms in a weight ratio of fatty acid to sulfonic acid of at least about 1:1 until the pH of the resulting mixture is from about 2 to about 3, and thereafter adding base to adjust the pH of the mixture to from about 4.5 to about 6.5.

6. A lubricant composition consisting essentially of:

(a) From about 5 to about 50 weight percent of a fatty acid amide represented by the formula:



wherein R^2 is a straight or branched chain alkyl or alkenyl group having from about 8 to about 22 carbon atoms, and R^3 is hydrogen or a

group wherein R^4 is a straight or branched chain alkyl or alkenyl group having from about 8 to 22 carbon atoms;

(b) From about 0.5 to about 10 weight percent of a normally-solid, water soluble polyethylene oxide having an average molecular weight of from about 50,000 to about 2,000,000;

(c) From about 2 to about 50 weight percent of a polyolefin wax having a melting point of from about 90° C. to about 110° C.;

(d) Up to about 20 weight percent of a natural wax having a melting point of from about 45° C. to about 90° C.; and

(e) From about 2 to about 20 weight percent of a partially-neutralized, modified sulfonic acid according to claim 1.

4,534,800

PROCESS AND APPARATUS FOR THE PRODUCTION OF SUGAR THICK JUICE FOR THE MANUFACTURE OF SUGAR

Bjarne Winstrom-Olsen, Nakskov, Denmark, assignor to Aktieselskabet de Danske Sukkerfabrikker, Copenhagen, Denmark

Filed Nov. 23, 1983, Ser. No. 554,681

Claims priority, application Denmark, Nov. 24, 1982, 5237/82

Int. Cl.³ C13D *3/06*

U.S. Cl. 127—12 **6 Claims**

1. A process for the production of sugar thick juice for the manufacture of sugar which process comprises the steps of

(a) carbonating lime-containing raw sugar juice in at least one stage by adding thereto carbon dioxide and soda to

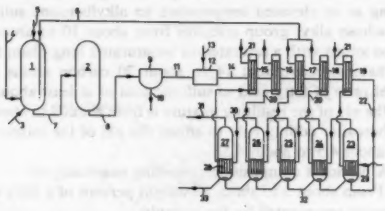
precipitate excessive amounts of calcium ions in the form of calcium salts,

(b) separating the precipitated calcium salts obtained in step (a) from the raw juice to form a thin juice,

(c) indirectly preheating the thin juice with a heating medium, concurrently forming a gaseous medium containing ammonia,

(d) evaporating the preheated thin juice obtained in step (c) to form thick juice and a gaseous effluent, said gaseous effluent being used as said heating medium in step (c), and

(e) collecting at least part of the gaseous medium containing ammonia formed in step (c) and adding said gaseous medium to the lime-containing raw sugar juice during step (a) so as to reduce the amount of soda required to precipitate calcium salts and to increase the sugar yield in said thick juice.



6. An apparatus for the production of sugar thick juice comprising at least one carbonation container having inlet means for lime-containing thin juice, means for adding carbon dioxide and soda to said container and outlet means for a slurry of calcium salts and sugar juice, means for separating calcium salts from said slurry so as to form thin juice, a plurality of preheaters connected in series and having means for indirectly heating thin juice and for forming a gaseous medium containing ammonia, a plurality of evaporators connected in series, each evaporator comprising an evaporation zone and a steam zone, the steam zone of at least one evaporator being connected with said means for indirectly heating thin juice of at least one preheater, and means for collecting gaseous medium formed in at least one preheater and for introducing said gaseous medium into said carbonation container.

4,534,801

PROCESS FOR REMOVING ADHERED SUBSTANCE FROM STEEL INGOTS

Shigeki Matsuoka, and Yoshihiro Naitoh, both of Tokai, Japan, assignors to Daido Steel Company Limited, Japan

Filed Feb. 17, 1983, Ser. No. 467,523
Claims priority, application Japan, Feb. 19, 1982, 57-24294
Int. Cl.³ B08B *7/00*
U.S. Cl. 134—15 **8 Claims**

1. A process for removing an adhered substance from a steel ingot formed by a casting process using molding additives comprising heating said steel ingot subsequent to the casting process with a heating rate at the surface layer portion of the steel ingot being not less than 2° C./second to provide a temperature difference between the starting point and the end point of the heating which is not less than 300° C. whereby said adhered substance caused by said molding additives is removed from the surface of said steel ingot.

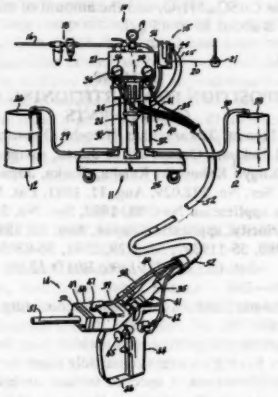
6. A process for removing an adhered substance from a steel ingot formed by a casting process using molding additives comprising cooling said steel ingot subsequent to said casting process with a cooling rate at the surface layer portion of said steel ingot being not less than 2° C./second to provide a temperature difference between the starting point and the end point of the cooling which is not less than 300° C. whereby said adhered substance caused by said molding additives is removed from the surface of said steel ingot.

4,534,802

AIR PURGE/SOLVENT BATH METHOD

William J. Gates, Glen Ellyn, Ill., and John F. Zwirlein, New Haven, Conn., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 354,427, Mar. 3, 1982, Pat. No. 4,460,126.
This application Jan. 23, 1984, Ser. No. 573,259
Int. Cl.³ B08B *9/00*; B05B *15/02*
U.S. Cl. 134—22.12 **24 Claims**



12. A method of cleaning a plural component foam dispensing apparatus after a shot of foam has been dispensed, the apparatus further utilizing a mixing gas of predetermined pressure to mix the plural components prior to dispensing the foam, comprising the steps of:

(a) delaying for a predetermined duration after dispensing the foam;

(b) dispensing a blast of purging gas under pressure for a predetermined duration through at least a portion of the dispensing apparatus;

(c) venting the mixing gas and purging gas from the dispensing apparatus;

(d) immersing at least a portion of the dispensing apparatus in a static, non-circulating solvent bath for a predetermined period of time to permit the solvent to displace the vented mixing gas and purging gas by traveling up at least a portion of the dispensing apparatus;

(e) removing the dispensing apparatus from the static solvent bath; and

(f) directing the mixing gas back through at least a portion of the dispensing apparatus.

4,534,803

METHOD OF CLEANING MACHINED SURFACE AND CHIP REMOVING TOOL

Hiroshige Asano, Kani, and Masayuki Moroto, Mie, both of Japan, assignors to Okuma Machinery Works Ltd., Kita, Japan

Filed Oct. 20, 1983, Ser. No. 543,616
Claims priority, application Japan, Oct. 23, 1982, 57-186592
Int. Cl.³ B08B *3/02, 5/00*
U.S. Cl. 134—30 **3 Claims**

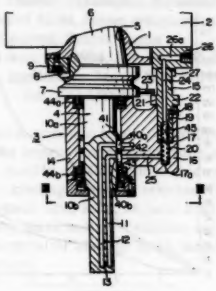
2. A method of cleaning a machined surface comprising:

mounting a chip removing tool having a compressed air flow path and a cooling water flow path, respectively, on a main spindle of a machining center, said pair of flow paths communicating with a mutual outlet;

rotating said chip removing tool unitarily with said main spindle whereby said mutual outlet rotates;

simultaneously jetting out compressed air and cooling water

from said mutual outlet, thereby to remove chips attached to a machined surface of a workpiece; and



thereafter, jetting out only said compressed air from said outlet to dry said machined surface.

4,534,804

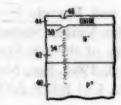
LASER PROCESS FOR FORMING IDENTICALLY POSITIONED ALIGNMENT MARKS ON THE OPPOSITE SIDES OF A SEMICONDUCTOR WAFER

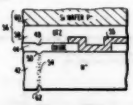
Paul E. Cade, Colchester, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 14, 1984, Ser. No. 620,644

Int. Cl.³ H01C *7/00;* **H01L** *21/265, 21/66*

U.S. Cl. 148—1.5 **5 Claims**





1. A method of forming alignment marks in a semiconductor body having a lightly doped first layer and an heavily doped second layer, said first layer having an optically exposed surface, comprising the steps of:

directing a laser beam onto said exposed surface in a direction perpendicular thereto, thereby forming in said exposed surface a scribed first alignment mark; and

choosing the wavelength of the laser beam to be beyond the absorption edge of the material of said semiconductor body so that the beam passes through said first layer without absorption but is absorbed by said second layer to produce therein a defect representing a second alignment mark positioned identically to the scribed first alignment mark.

4,534,805

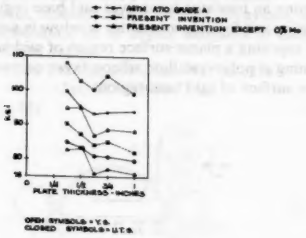
LOW ALLOY STEEL PLATE AND PROCESS FOR PRODUCTION THEREOF

Rodney J. Jesseman, Middletown, Ohio, assignor to Armco Inc., Middletown, Ohio

Continuation of Ser. No. 476,353, Mar. 17, 1983, abandoned. This application Sep. 26, 1983, Ser. No. 535,542

Int. Cl.³ C21D *8/02*

U.S. Cl. 148—12.3 **7 Claims**



1. A process for producing a low alloy steel shape of at least 3/16 inch thickness exhibiting a yield strength of at least 80 ksi at room temperature and a Charpy V-Notch impact strength (longitudinal) of at least 50 ft-lbs (68 Joules) at −80° F. (−62° C.) in the austenitized, quenched, and precipitation hardened condition together with excellent weldability including retained toughness in the heat affected zone of a weldment, comprising the steps of providing a steel starting material consisting essentially of, in weight percent, from about 0.02% to 0.07% carbon, 1.2% to 2.0% manganese, 0.020% maximum sulfur, up to 0.5% silicon, 0.1% to 0.4% molybdenum, 0.01% to 0.1% columbium, about 0.01% to 0.10% acid soluble aluminum, about 0.8% to 2.0% copper, about 0.4% to 2.0% nickel, residual chromium, and balance iron except for incidental impurities; hot reducing said starting material to a desired final thickness; cooling to a temperature at which the steel transforms to ferrite; reheating the hot reduced shape to a temperature of about 1600° to 1800° F. (871° to 982° C.) and within the austenization range whereby to transform said ferrite to austenite; quenching at a rate which transforms substantially all said austenite to predominantly fine acicular ferrite and lower-bainite and which avoids substantial precipitation of copper-rich particles; and precipitation hardening by heating within the range between about 900° F. and the A_{C1} point.

5. Precipitation hardened low alloy steel shape of at least 3/16 inch thickness having a predominantly acicular ferrite and lower-bainite microstructure, exhibiting a yield strength of at least 85 ksi at room temperature and a Charpy V-notch impact strength (longitudinal) of at least 50 ft-lb at −80° F., together with excellent weldability including retained toughness in the heat affected zone of a weldment, said steel consisting essentially of, in weight percent, from about 0.02% to 0.07% carbon, from 1.2% to 2.0% manganese, 0.020% maximum sulfur, up to 0.5% silicon, 0.1% to 0.4% molybdenum, 0.01% to 0.1% columbium, about 0.01% to 0.10% acid soluble aluminum, about 0.8% to 2.0% copper, about 0.4% to 2.0% nickel, residual chromium and balance iron except for incidental impurities.

4,534,806

METHOD FOR MANUFACTURING VERTICAL PNP TRANSISTOR WITH SHALLOW EMITTER

Ingrid E. Magdo, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 99,695, Dec. 3, 1979, abandoned. This application Mar. 7, 1983, Ser. No. 472,897

Int. Cl.³ H01L *21/265, 21/225*

U.S. Cl. 148—1.5 **10 Claims**

1. A process for forming a vertical PNP transistor having a

high current gain exceeding about 200 and a high frequency response due to said transistor having a shallow, dislocation-free, P-type diffused emitter, said emitter further characterized by a steep concentration gradient, said process comprising the steps of:

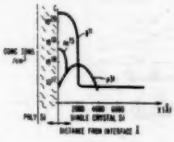
(a) providing a monocrystalline semiconductor silicon substrate having a subcollector region doped with a P-type impurity;

(b) forming an N-type base region for said transistor in said substrate;

(c) forming an insulator layer over said base region;

(d) defining and forming an emitter window in said insulator layer exposing a planar surface region of said base region;

(e) forming a polycrystalline silicon layer on said exposed planar surface of said base region;



(f) doping said polycrystalline silicon layer with P-type impurities in a region adjacent to a desired emitter region to maintain a critical concentration of said P-type impurities at the interface between the polycrystalline silicon layer and the monocrystalline substrate below the concentration level of about 5×10^{19} ions/cm^3; and

(g) subjecting the resulting structure to conditions whereby the P-type doping ions contained in the polycrystalline silicon layer are controllably driven into the monocrystalline silicon forming an emitter region having a s eep concentration gradient given by a concentration of P-type ions of at least 1×10^{19} ions/cm^3 extending to a de$_{\text{r}}$th of at least 2000 Å and a concentration of less than about 1×10^{16} ions/cm^3 at a depth of about 3500 Å from the surface of the monocrystalline silicon without effecting dislocations in the monocrystalline silicon.

4,534,807

HEAT TREATMENT OF ALUMINIUM ALLOYS CONTAINING LITHIUM

David J. Field, Staffordshire; Ernest P. Butler, Tunbridge Wells, and Katherine-Ann Bassett, Banbury, all of England, assignors to Alcan International Limited, Montreal, Canada

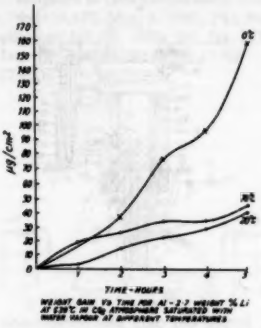
Filed Mar. 27, 1984, Ser. No. 593,958

Claims priority, application United Kingdom, Apr. 6, 1983, 8309349

Int. Cl.[3] **C22F** *1/02*

U.S. Cl. 148—20.3 **6 Claims**

1. In a process for heat treating an article of an alloy having a major content of aluminium and a minor content of at least one alloying element, said one alloying element being lithium present in a proportion of above 0.5% by weight, and said process comprising the step of heating the article to a temperature above 450° C., the improvement which comprises performing said heating step in an atmosphere of carbon dioxide



and water vapour, the partial pressure of water vapour in such atmosphere being at least 4 torr.

4,534,808

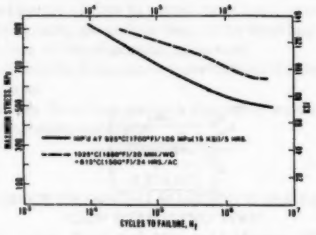
METHOD FOR REFINING MICROSTRUCTURES OF PREALLOYED POWDER METALLURGY TITANIUM ARTICLES

Daniel Eylon, Dayton, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 5, 1984, Ser. No. 617,445

Int. Cl.[3] **B22F** *3/00*

U.S. Cl. 148—133 **7 Claims**



1. A method for improving the microstructure of an article made by powder metallurgy of prealloyed titanium powder which comprises, in combination, the steps of:

a. beta-solution heat treating said article at a temperature approximately equal to the beta-transus temperature of said alloy;

b. cooling said article at a rate in excess of air cooling to room temperature;

c. annealing said article at a temperature in the approximate range of 10 to 20% below said beta-transus temperature for about 4 to 36 hours; and,

d. air cooling said article to room temperature.

4,534,809
WATER-IN-OIL EMULSION EXPLOSIVE COMPOSITION

Fumio Takeuchi; Masao Takahashi; Katsuhide Hattori, and Hiroshi Sakai, all of Aichi, Japan, assignors to Nippon Oil and Fats Company Limited, Tokyo, Japan

Filed Aug. 28, 1984, Ser. No. 645,079
Claims priority, application Japan, Sep. 7, 1983, 58-163119
Int. Cl.³ C06B *45/18*
U.S. Cl. 149—3 **11 Claims**

1. In a water-in-oil emulsion explosive composition containing microvoids, the improvement comprising said microvoids being neutral or weakly acidic hollow microspheres coated with at least one coating material selected from the group consisting of inorganic acid salts, organic acid salts and chlorides of ammonium, alkali metal or alkaline earth metal which ammonium, alkali metal or alkaline earth metal may be partly replaced by hydrogen.

4,534,810
RED PHOSPHOROUS SMOKE PRODUCING COMPOSITION

Charles A. Knapp, Wayne, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

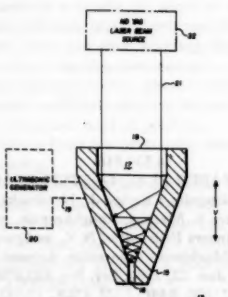
Filed Jan. 30, 1984, Ser. No. 574,836
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.6 **12 Claims**

1. An improved smoke producing composition for military screening operations having an intiation period of about 5 seconds, and a persistent cloud lasting about 10 minutes consisting of (a) red phosphorus having a particle size of between about 5μ and about 15μ and being present in an amount of between about 75 to about 90 parts by weight, (b) sodium nitrate having a particle size of about 15μ and about 45μ and being present in an amount between about 10 and 20 parts by weight, and (c) an epoxy binder between about 4 and about 10 parts by weight.

4,534,811
APPARATUS FOR THERMO BONDING SURFACES

Norman G. Ainslie, Croton-on-Hudson, and Swie-In Tan, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,219
Int. Cl.³ B23K *9/04, 26/00;* B29C *27/08*
U.S. Cl. 156—73.1 **6 Claims**



1. A bonding apparatus for bonding circuit elements together comprising:

a laser generator for producing a laser beam;

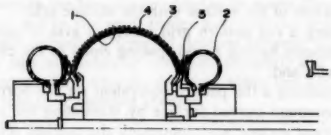
a bonding tip having one end open to receive said laser beam, said bonding tip having an interior wall surface conically tapered from said one open end to an opposite heating end, an interior generally conical taper of said tip forming a black body cavity whereby said laser beam energy is absorbed by black body absorption to heat said tip; and

means for adding ultrasonic bonding energy to said tip whereby said tip, when applied to surfaces to be joined together, results in said sufaces being bonded.

4,534,812
METHOD FOR FORMING TIRES

Yoshihiro Fukui, Hadano; Isamu Tuchiya, Nirayama, and Shun Yoshida, Kamakura, all of Japan, assignors to Zeon Kosan Co., Ltd., Chuo, Japan

Filed Feb. 28, 1984, Ser. No. 584,324
Int. Cl.³ B29H *17/22*
U.S. Cl. 156—132 **5 Claims**



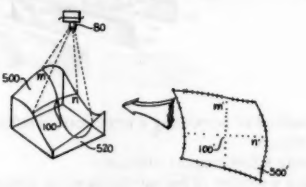
1. A method for forming tires by the use of a tire-forming machine including a drum bladder and a turnup bladder, the method comprising applying an organic halogen compound having in the molecule a

bond, in which X represents a halogen, to the surfaces of the drum bladder and turnup bladder to form a layer of the organic halogen compound thereon, whereby sticking of a unvulcanized rubber for tires to the bladders is prevented during the course of the forming of a tire from the unvulcanized rubber.

4,534,813
COMPOUND CURVE-FLAT PATTERN PROCESS

Robert D. Williamson, St. Charles, and Sidney M. Furst, Maryland Heights, both of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Jul. 26, 1982, Ser. No. 402,051
Int. Cl.³ B29C *17/04;* B65H *81/00;* B32B *31/00*
U.S. Cl. 156—212 **11 Claims**



1. A process for forming an article comprising bonded multiple plies of a woven material arrayed to form a compound curved surface, the process comprising:

forming a unique flat pattern equivalent for the compound curved surface for each ply wherein the flat pattern and the compound curved surface each have common reference means;

forming each ply to correspond to its flat pattern equivalent;

laying up the plies upon a tool which duplicates the compound curved surface wherein the plies and the tool also have the common reference means such that each ply is

referenced to the common reference means on the tool; and

bonding the plies together to form the article wherein said step of forming a unique flate pattern equivalent for the compound curved surface comprises:

forming two tooling lines upon a portion of the surface such that the lines intersect within the boundaries of the portion;

forming a surface grid of quadrilateral elements with identifiable points at the vertices of the elements upon the surface such that each of the points is separated from an adjacent point by an identical chordal distance, one such point being coincident with the intersection of the tooling lines, and two groups of such points being formed at consecutive said identical chordal distances along the tooling lines;

marking the intersections of selected surface features of the portion of the surface with the surface grid;

forming a flat pattern grid having a grid of quadrilateral elements having a grid spacing equal to the chordal distance; and,

determining a flat pattern equivalent for the portion of the compound curved surface by translating the compound curved surface grid containing the marked intersections onto the flat pattern grid.

4,534,814

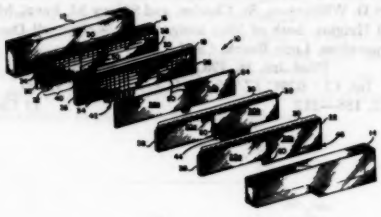
LARGE-SCALE PRINTHEAD FOR NON-IMPACT PRINTER AND METHOD OF MANUFACTURE

Luke Volpe, Melrose, and Lowell E. Thomas, Tewksbury, both of Mass., assignors to Dynamics Research Corporation, Wilmington, Mass.

Filed Jul. 5, 1983, Ser. No. 510,921

Int. Cl.[3] **B32B** *31/00*; **B29C** *19/00*; **G01D** *15/10*; **H05B** *1/00*

U.S. Cl. 156—300 **4 Claims**



1. A method of fabricating a large-scale printhead comprising the steps of

providing a first support substrate;

adhering a number of butted styli-bearing substrate sections to the first support substrate to provide a first composite structure in which the butted sections lie in the same plane;

providing a second support substrate;

adhering a number of butted styli-bearing substrate sections to the second support substrate to provide a second composite structure in which the butted sections lie in the same plane; and

adhering the first and second composite structures together such that the butted styli-bearing substrate sections on each of the first and second support substrates are facing each other.

4,534,815

ADHESIVE PRIMER COMPOSITION AND BONDING METHOD EMPLOYING SAME

Mitsuo Hamada, and Sadami Yasuda, both of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 497,761, May 24, 1983, abandoned, which is a division of Ser. No. 308,338, Oct. 5, 1981,. This application Nov. 15, 1984, Ser. No. 671,807

Claims priority, application Japan, Oct. 9, 1980, 55-141637

Int. Cl.[3] **C09J** *5/02*

U.S. Cl. 156—307.5 **2 Claims**

1. A method of bonding thermosetting silicone rubber to a substrate consisting of

(1) coating the substrate with an adhesive primer composition consisting essentially of

(A) 100 parts by weight of an organosilicon compound of the average unit formula

$$R_a(XR^1)_b(OR^2)_cSiO_{\frac{4-a-b-c}{2}}$$

in which R represents a monovalent hydrocarbon radical or a halogenated monovalent hydrocarbon radical, X represents a monovalent radical selected from the group consisting of epoxy, acryloxy, methacryloxy, amino, N-alkylamino, N-phenylamino, N-aminoalkylamino, cyano, and mercapto, R^1 represents a bivalent radical selected from the group consisting of hydrocarbon radicals, halogenated hydrocarbon radicals, hydroxyhydrocarbon radicals, and ether radicals, R^2 represents an alkyl radical or an alkoxyalkyl radical, a has a value such that $0 \leqq a \leqq 3$, b has a value such that $0 \leqq b \leqq 3$, c has a value such that $0 < c \leqq 4$, and the sum of $a+b+c$ has a value such that $0 < (a+b+c) \leqq 4$, and there is at least one $-OR^2$ per molecule of organosilicon compound,

(B) 3 to 60 parts by weight of vinyltris(tertiary-butylperoxy)silane, and

(C) at least 4.5 parts by weight of an organic solvent,

(2) air drying the coated substrate obtained from step (1) for at least 30 minutes at room temperature,

(3) applying over the dried primer coating obtained from step (2), a silicone rubber composition which is heat vulcanizable,

(4) heating the assembly obtained from step (3) to cure the silicone rubber composition.

4,534,816

SINGLE WAFER PLASMA ETCH REACTOR

Lee Chen, Poughkeepsie; Charles J. Hendricks, Wappingers Falls; Gangadhara S. Mathad, Poughkeepsie, and Stanley J. Poloncic, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,670

Int. Cl.[3] **H01L** *21/306*; **B44C** *1/22*; **C03C** *15/00*; **C23F** *1/02*

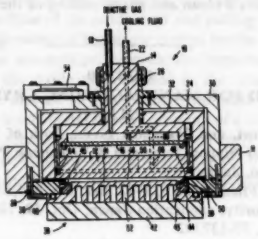
U.S. Cl. 156—345 **14 Claims**

1. Apparatus for plasma etching a semiconductor wafer comprising:

a fluid cooled lower electrode for supporting said wafer;

a fluid cooled upper electrode substantially parallel to and spaced apart from said lower electrode a distance such that the aspect ratio is greater than about 25, said upper electrode including means for distributing a reactive gas uniformly over said wafer;

means for coupling RF power to one or both of said electrodes; and



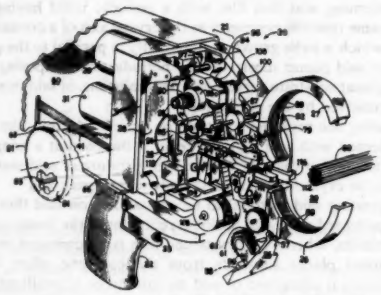
means for confining a plasma between said upper and lower electrodes.

4,534,817

AUTOMATIC BUNDLE-TYING TOOL

Denis P. O'Sullivan, 91 Shelter Rock Rd., Danbury, Conn. 06810

Filed Apr. 8, 1983, Ser. No. 483,124
Int. Cl.[3] B65B *13/06, 13/32*
U.S. Cl. 156—352 **17 Claims**



1. An automatic bundle-tying tool for wrapping flexible plastic tape around a bundle of wires or similar elongated objects, drawing the tape taut to compress the bundle, bonding the overlapped tape and then severing the bonded tape to release the wrapped bundle, comprising

A. a housing having a hollow central enclosure, and a movable actuator resiliently depressible from a forward position to a depressed latched position,

B. a tape-guiding fixed jaw protruding from the forward end of the housing,

C. a tape-guiding movable jaw pivoted at the forward end of the housing for movement between an open position spaced away from the fixed jaw and a closed position abutting the fixed jaw in which means forming inward-facing, tape-guiding grooves in both jaws are aligned to encircle a bundle-tying zone,

D. a resiliently biased tape-rewinding tape storage spool rotatably mounted on the rear of the housing,

E. an arming linkage inside the hollow housing operatively connecting the actuator to close the movable jaw when the actuator is depressed to its latched position,

F. drive means in the housing having a forward mode tractively drawing flexible plastic tape from the tape storage spool and feeding it endwise via the tape-guiding grooves to encircle the tying zone with at least one layer of tape whose leading end is thence returned to overlap itself in a tape bonding zone, and a reverse mode retracting the tape to draw the tape around the bundle,

G. an ultrasonic transducer anchored in the housing and having a bonding tip protruding into the bonding zone,

H. a tape cutter mounted near the bonding tip for movement between a forward position protruding into the bonding zone and a rearward retracted position,

I. a pair of tape-clamping anvil blades having thin beveled tips flanking the transducer's bonding tip and movable between an unclamped position wherein the anvil tips are moved forward and retracted laterally and a clamped position wherein the anvil tips are moved inward and rearward into juxtaposition directly in front of the bonding tip for sandwiching and clamping the overlapped tying tape in the bonding zone between the anvil blade tips and bonding tip,

J. a forwardly resiliently biased retracting arm pivotally mounted in the housing provided with means connecting its free end to the anvil blades and with the arm being movable between a forward position wherein the anvil blade tips are laterally retracted forward, and a rear latched position wherein the anvil blade tips are drawn back into their clamped position,

K. means operatively connecting the cutter to the arming linkage and positioning the cutter in its retracted position when the movable jaw is closed and in its forward position when the movable jaw is open,

L. control means responsive to the completion of the tape feeding forward drive mode operation and thereafter propelling the retracting arm to its rear latched position clamping the anvil blade tips against the overlapped tape to actuate timing means initiating reverse mode tape tautening, and then energizing the transducer to bond the overlapped tape,

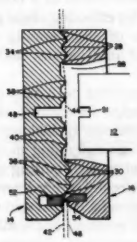
M. and actuator release means responsive to completion of the tape-bonding operation of the transducer and connected to unlatch the depressed actuator releasing the retracting arm from its latched rear position which then moves the cutter forward to sever the rearmost layer of tape while opening the anvil tips and the movable jaw to release the wrapped and tied bundle.

4,534,818

METHOD AND APPARATUS FOR ULTRASONIC SEALING

William D. Kreager, Dallas, and Kenneth R. Berger, Grapevine, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Dec. 22, 1983, Ser. No. 564,754
Int. Cl.[3] B29C *27/08;* **B29D** *23/10*
U.S. Cl. 156—466 **6 Claims**



4. An apparatus for sealing flexible packaging material on a form and fill packaging machine to produce flexible bags having ultrasonically sealed end seals, comprising:

a. cooperating land and valley regions provided on a portion of first and second movable members;

b. a plurality of first land regions comprising an anvil on said first movable member, said first land regions extending

beyond a centerline of said first and second members when closed;

c. said first land regions interacting with a plurality of second land regions on said second member, said second land regions extending beyond said centerline;

d. said first and second land regions cooperating such that packaging material is biased against said anvil when said first and second movable members are closed;

e. said second movable member provided with an ultrasonic horn which effects an ultrasonic seal at the location of said anvil when the packaging material is biased thereagainst; and

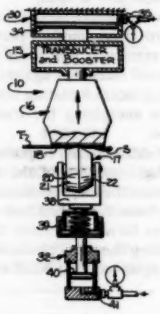
f. an ultrasonic back seal forming device for making continuous longitudinal ultrasonic back seals, said back seal being sealed in the direction of travel of said packaging material.

4,534,819

WOVEN TEXTILE FABRIC HAVING AN ULTRASONICALLY CUT AND SEALED EDGE AND APPARATUS AND PROCESS FOR PRODUCING SAME

George L. Payet, Fort Mill, and Stephen C. Ballard, Lancaster, both of S.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Nov. 28, 1983, Ser. No. 555,664
Int. Cl.[3] B29C 27/08; B32B 31/18
U.S. Cl. 156—515 20 Claims



1. In an ultrasonic apparatus for edge cutting and sealing moving lengths of at least partially thermoplastic material, particularly textile fabric having at least some thermoplastic fibers, and including anvil means and vibrating sonic horn means having a flat working face cooperating with and vibrating against said anvil means for the ultrasonic edge cutting and sealing as the material moves between said sonic horn and said anvil means; the improvement of a construction of said anvil means characterized by effecting clean and sharp edge cutting and desired amounts of edge sealing in the material while resisting wear on said anvil means, said anvil means comprising:

a wheel having a beveled periphery defining therearound a peaked cutting edge for cutting the moving material as said sonic horn vibrates against said cutting edge and first and second surfaces extending in respective opposite directions from said peaked cutting edge;

said first surface forming a predetermined included acute angle with said horn face from said cutting edge for fusing the thermoplastic material and sealing the cut edge of the material a predetermined distance inwardly of the cut edge as said sonic horn vibrates against said anvil means, the predetermined distance of sealing being determined by and increasing with the increasing acuteness of the predetermined included angle of said first surface; and

said second surface forming a predetermined included acute angle with said horn face from said cutting edge for reinforcing said anvil cutting edge to resist wear on said anvil cutting edge, the included angle of said second reinforcing surface being greater than the included angle of said first sealing surface so that said first and second surfaces will form a sharpness for said peaked anvil cutting edge which will effect a clean and sharp cutting of the moving material.

4,534,820

METHOD FOR MANUFACTURING CRYSTALLINE FILM

Hidefumi Mori, and Masahiro Ikeda, both of Tokyo, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Oct. 15, 1982, Ser. No. 434,536
Claims priority, application Japan, Oct. 19, 1981, 56-166950; Aug. 9, 1982, 57-137392
Int. Cl.[3] C30B 25/04, 3/00
U.S. Cl. 156—603 17 Claims

1. A method for manufacturing a crystalline film, comprising the steps of:

depositing a thin film of a metallic material of which a eutectic compound is produced together with a material to be crystallized, on a planar amorphous or metallic substrate;

patterning said thin film with a periodic relief having the same rotation symmetry as the crystal axis of a crystal face which is to be grown preferentially in parallel to the plane of said planar substrate, said periodic relief exposing said planar substrate corresponding to portions of said thin film removed by the patterning;

heating the resuking substrate on which said thin film patterned with said periodic relief is disposed at a temperature higher than the eutectic temperature of said material to be crystallized and said metallic material; and

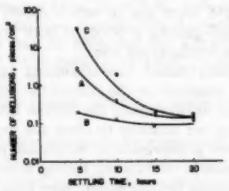
depositing said material to be crystallized on said thin film patterned with said periodic relief under the heating conditions, whereby a crystalline film is precipitated on the initial planar substrate from the euctectic alloy layer which is composed of said material to be crystallized and said metallic thin film by the above steps.

4,534,821

SINGLE CRYSTAL GROWING OF RARE EARTH-GALLIUM GARNET

Susumu Sakaguchi; Ken Itoh; Masahiro Ogihara; Shinji Makigawa; Toshihiko Ryuo, and Kazuyoshi Watanabe, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,837
Claims priority, application Japan, Nov. 8, 1982, 57-195703
Int. Cl.[3] C30B 15/14
U.S. Cl. 156—617 SP 4 Claims



1. In the method for the preparation of a single crystal boule of a rare earth-gallium garnet by the Czochralski crystal grow-

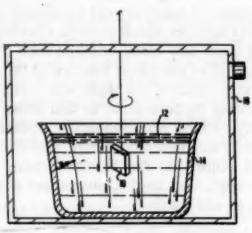
ing procedure comprising melting a mixture of a rare earth oxide and gallium oxide to form an oxide melt in an iridium crucible, contacting a seed crystal of the rare earth-gallium garnet to the surface of the oxide melt and pulling up the seed crystal to start growing of the single crystal on the seed crystal under a gaseous atmosphere, wherein the improvement comprises keeping the oxide melt formed in the crucible in the molten state for at least 15 hours before the oxide melt is contacted with the seed crystal to start growing of a single crystal, contacting the seed crystal with the oxide melt to start the growing and growing the garnet to a diameter of at least 50 mm in an iridium crucible having an inner diameter of at least 80 mm.

4,534,822

METHOD OF SYNTHESIZING THIN, SINGLE CRYSTAL LAYERS OF SILVER THIOGALLATE ($AGGAS_2$)

Sanat K. Sashital, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Apr. 30, 1984, Ser. No. 605,363
Int. Cl.³ C30B *19/02*
U.S. Cl. 156—624 **14 Claims**



1. A method of growing a single crystal layer of high purity silver thiogallate comprising the steps of:

(a) preparing a liquid solution of silver thiogallate in a solvent selected from the group consisting of antimony sulfide and lead sulfide;

(b) placing in the solution a seed crystal which has an appropriate lattice parameter relationship with silver thiogallate; and

(c) slowly cooling the solution to form on the seed crystal a layer of a single crystal of silver thiogallate.

4,534,823

CHEMICAL MILLING IN-100 NICKEL SUPERALLOY

Robert E. Fishter, Boca Raton; Paul L. McDaniel, Hobe Sound, both of Fla., and Stephen W. Tefft, Houston, Tex., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 5, 1983, Ser. No. 558,415
Int. Cl.³ C23F *1/00*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—626 **7 Claims**

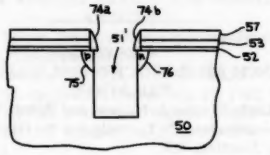
1. The method of chemically milling the surface of a nickel superalloy workpiece having a composition which is essentially IN-100 alloy which comprises contacting the alloy with an aqueous solution consisting essentially by volume percent of 32.5–85 hydrochloric acid, the solution containing as ingredients proportioned on the volume of hydrochloric acid, 35–45 ml/l nitric acid; 0.0122–0.0160M/l metal sulfate ion; 0.0283–0.0369M/l metal chloride ion; 0.0146–0.0190M/l metal fluoride ion; and 0.0063–0.0083M/l citric acid.

4,534,824

PROCESS FOR FORMING ISOLATION SLOTS HAVING IMMUNITY TO SURFACE INVERSION

Pau-Ling Chen, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 16, 1984, Ser. No. 600,911
Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—628 **6 Claims**



1. A process for fabricating slots in semiconductor substrates which slots have inversion stoppers adjacent the mouths of the slots, comprising the steps of:

applying at least one overlying layer to said substrate to define a region in which a slot is to be formed;

patterning said at least one layer to define a slot region to be formed;

forming a spacer on the surface of said substrate adjacent the edge of said at least one layer that defines whenever said inversion stopper regions are to be formed;

forming an inversion stopper of one conductivity type in said substrate adjacent said mouth of said slot around at least a portion of the periphery of said slot, said one conductivity type being the opposite conductivity type to the conductivity type of said substrate adjacent said stopper; and

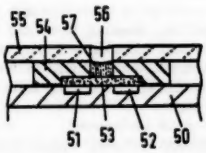
forming said slot by a directed beam process whereby said spacer serves to impede the undercutting of said at least one layer and thereby retains the original extent of said inversion stopper region.

4,534,825

METHOD OF MAKING AN ELECTROCHEMICAL SENSING CELL

Gerrit Koning, Vries, and Piet Bergveld, Enschede, both of Netherlands, assignors to Cordis Europa, N.V., Roden, Netherlands

Division of Ser. No. 242,351, Mar. 10, 1981, Pat. No. 4,478,222. This application Mar. 9, 1984, Ser. No. 587,819
Claims priority, application Netherlands, Mar. 10, 1980, 8001420
Int. Cl.³ G01N *27/46*
U.S. Cl. 156—644 **5 Claims**



1. A method of making a sensing cell for a chemically sensitive probe for measuring the properties of biological fluids in vivo, comprising the steps of

producing a wafer comprising an ISFET with spaced source and drain regions spanned by an ion-sensitive gate portion, covering said source and drain regions and gate portion of said ISFET with a temporary first layer of soluble material,

covering said temporary first layer with a second layer of relatively insoluble material,

defining an opening in said second layer directly above said gate region, and

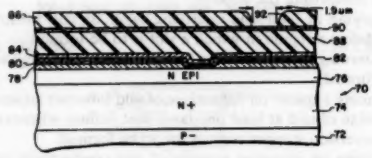
removing said temporary first layer which covers the source and drain regions and the gate portion by introducing a solvent through said opening to dissolve said first layer, thus forming a sensing chamber encompassing the source and drain regions as well as the gate portion of said ISFET.

4,534,826

TRENCH ETCH PROCESS FOR DIELECTRIC ISOLATION

George R. Goth; Thomas A. Hansen, and Robert T. Villetto, Jr., all of Poughkeepsie, N.Y., assignors to IBM Corporation, Hopewell Junction, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,593
Int. Cl.[3] H01L *21/20*; C23C *13/04*
U.S. Cl. 156—643 7 Claims



1. In a process of forming integrated circuit devices in a semiconductor substrate, according to which isolation trenches are produced by selectively etching through at least one trench-defining masking layer and at least one passivating layer disposed above the substrate, in order to reach down to the upper surface of said substrate, subsequent to an initial step of forming a pattern of openings through a conventional uppermost photoresist layer disposed above said trench-defining mask layer, the improvement comprising the steps of:

first, plasma-depositing SiO_2 to define the trench-defining masking layer;

interposing between said trench-defining masking layer and said uppermost photoresist layer, a first organic underlayer and a second, barrier layer above said organic underlayer;

then, creating the conventional pattern of openings through the uppermost photoresist layer, followed by selectively etching corresponding openings in said barrier layer;

followed by the further step of selectively etching the organic underlayer, by using a highly selective etchant, whereby substantially perfectly vertical walls are produced in the corresponding pattern of openings in the organic underlayer;

extending said openings by anisotropically etching through said trench-defining masking layer and said passivating layer down to said substrate whereby substantially perfectly vertical walls are produced in the corresponding pattern of openings in the masking layer and passivating layer;

removing said organic underlayer;

forming the isolation trenches within the semiconductor substrate by using an anisotropic highly selective etchant to etch into said substrate whereby substantially perfectly vertical walls are produced in the trenches,

said highly selective etchant being a gas comprising SF_6CL_2 and an inert gas,

removing said trench-defining masking layer by the use of an HF solution such that the high etch ratio, which obtains between the plasma-deposited trench-defining masking layer of SiO_2 and the passiating layer of SiO_2 when such HF solution is used, precludes significant etching of said passivating layer, and

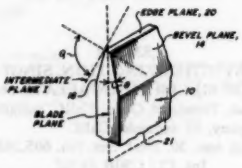
opening device contact holes in said passivating layer without the use of masking to protect said walls of said trenches.

4,534,827

CUTTING IMPLEMENT AND METHOD OF MAKING SAME

Donald W. Henderson, 20 Woodlane Rd., Ithaca, N.Y. 14850

Filed Aug. 26, 1983, Ser. No. 527,165
Int. Cl.[3] C23F *1/00, 1/06*; A61B *17/32*
U.S. Cl. 156—647 8 Claims



1. A method of fabricating a cutting instrument from single crystal material comprising the steps of:

providing a blank of single crystal aluminum oxide material having bevel surfaces which provide a preliminary cutting instrument edge, said blank oriented such that the (0601) plane is parallel to the planar bisector of the angle formed by the bevel surfaces of the blank which meet at the edge, the c-axis being perpendicular to said plane; and

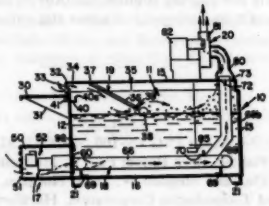
simultaneously etching and chemically polishing the blank to form the cutting instrument edge, said etchant acting as a chemical polish for the bevels forming said cutting instrument edge, said cutting instrument edge being perpendicular to said c-axis.

4,534,828

EVAPORATOR APPARATUS

Dale C. Erickson, St. Paul, and Norton J. Erickson, New Brighton, both of Minn., assignors to Nordale Incorporated, Blane, Minn.

Continuation-in-part of Ser. No. 310,649, Oct. 13, 1981, abandoned. This application Sep. 30, 1983, Ser. No. 537,976
Int. Cl.[3] B01D *1/04*; C02F *1/04*
U.S. Cl. 159—16.1 6 Claims



1. An apparatus for converting a liquid of mostly water contaminated with water soluble and insoluble substances into a less contaminated vapor, comprising:

(a) a container for holding said liquid, said container having a bottom and a top portion, said liquid having a top surface;

(b) means positioned in said container for heating said liquid in said container, whereby vapor is formed from the evaporation of said liquid;

(c) means attached to said container for mixing air with said

vapor, said mixing means including a first opening in the top portion of said container and means for directing a flow of air along the top surface of said liquid thereby replacing saturated air with unsaturated air to enhance vaporization, said directing means including a floating baffle attached to the top portion of said container, said baffle having a second opening therethrough; and

(d) means attached to said container for exhausting said air and said vapor from said container, said exhausting means including a fan for drawing air passed said directing means to mix with the vapor and exhaust the mixture.

4,534,829
CALENDER

Karl-Heinz Ahrweiler, Willich; Helmut Anstötz, Tönisvorst, and Werner Hartmann, Krefeld, all of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld-Forstwald, Fed. Rep. of Germany

Filed Jan. 19, 1983, Ser. No. 459,198

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201635

Int. Cl.³ D21G *1/00*

U.S. Cl. 162—361 **8 Claims**

1. A supercalender for in-line employment at a paper machine, comprising:

a first pair of zone-wise deflection-controlled rollers forming a first roller nip;

a second pair of zone-wise deflection-controlled rollers forming a second roller nip, said second pair being closely spaced from said first pair along a paper travel path extending from the output of the paper machine; and

each of said pairs including a hard roller and a soft roller with an elastic covering having a hardness of at least 85° Shore D, and a thickness of at least fifteen millimeters.

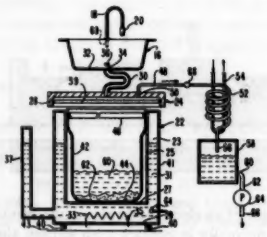
4,534,830
SOLVENT RECOVERY METHOD

Manuel G. Pastor, Berkeley, Calif., assignor to Zerpa Industries, Inc., San Jose, Calif.

Division of Ser. No. 485,496, Apr. 22, 1983, Pat. No. 4,457,805, which is a continuation of Ser. No. 250,798, Apr. 3, 1981,. This application Oct. 5, 1983, Ser. No. 539,202

Int. Cl.³ B01D *3/02*

U.S. Cl. 203—86 **12 Claims**



1. In a solvent recovery method having a distilling mode and an emptying mode, the improvement comprising:

providing a tank having a heating means for heating the interior of said tank;

placing a plastic bag within said interior of the tank so that at least a part of the bag forms a substantially liquid-tight barrier between contaminated solvent within said bag and said heating means during said distilling mode;

heating the contaminated solvent during the distilling mode to separate clean solvent vapor from the contaminants;

allowing the clean solvent vapor to be directed out of the bag; and

removing said plastic bag when it contains a quantity of contaminants during the emptying mode.

4,534,831
METHOD OF AND APPARATUS FOR FORMING A 3D ARTICLE

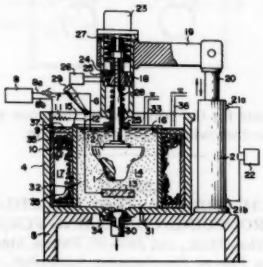
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Sep. 23, 1983, Ser. No. 535,357

Claims priority, application Japan, Sep. 27, 1982, 57-166536; Oct. 4, 1982, 57-173247; Nov. 19, 1982, 57-202058

Int. Cl.³ C25D *1/10, 1/20, 17/00*

U.S. Cl. 204—4 **18 Claims**



1. A method of making a shaped article, comprising the steps of:

(a) preparing a shaped mold having a contoured surface complementary to that of the shaped article;

(b) electroforming a layer of metal onto said mold;

(c) without destroying said mold, mechanically separating said layer of metal therefrom to provide said shaped articles and, subsequent to step (a) and prior to step (b),

(d) mirror-finishing the contoured surface of said shaped mold; and

(e) anodizing the mirror-finished contoured surface to form an oxide film thereon at least over a substantial proportion of the surface area thereof to a degree sufficient to assure the mechanical separation in step (c) without impairing said electroformed layer of metal and without materially destroying said mold.

4,534,832
ARRANGEMENT AND METHOD FOR CURRENT DENSITY CONTROL IN ELECTROPLATING

Laurea Doiron, Jr., Pelham, N.H., assignor to Emtek, Inc., Haverhill, Mass.

Filed Aug. 27, 1984, Ser. No. 644,711

Int. Cl.³ C25D *5/02, 21/10*

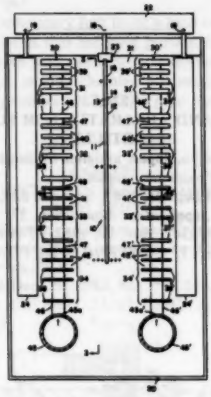
U.S. Cl. 204—15 **11 Claims**

1. In an arrangement for plating a circuit board or the like, the board having a surface to be plated and on the surface a vertically disposed conductive foil having a connection to serve as a cathode, the foil being masked by a non-conductive layer leaving the foil exposed in a pattern to be plated:

an anode; and

a shield of non-conductive material between the board and

the anode and having sections with spacing between the non-conductive material of a section varied vertically to



compensate for the voltage drop from one portion of the foil to another when in use as a cathode.

4,534,833

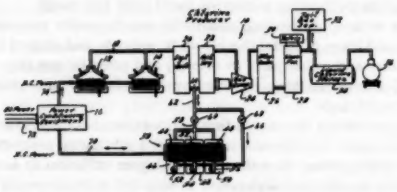
ZINC-CHLORIDE BATTERY IN A CHLORINE PRODUCING/CONSUMING PLANT

Peter Carr, Utica, Mich., and John W. Rowen, Stamford, Conn., assignors to Energy Development Associates, Inc., Greensboro, N.C.

Continuation of Ser. No. 374,395, Mar. 5, 1982, abandoned. This application Feb. 14, 1984, Ser. No. 579,290

Int. Cl.³ C25B *1/00*; H01M *8/18*

U.S. Cl. 204—128 **33 Claims**



1. An electrochemical system comprising:

gas producing means having at least one electrolytic cell for generating gas and having outlet means for removing said gas from said system;

secondary energy storage cell in contact with an electrolyte for generating said gas during a charging cycle and for consuming a portion of said gas during a discharging cycle;

conduit means cooperating with said gas producing means and said secondary energy storage cell for permitting said secondary energy storage cell during said charging cycle to supplement the amount of said gas generated by said gas producing means, and for permitting said gas producing means to supply said gas to said secondary energy storage cell during said discharging cycle;

power conditioning means electrically coupled to said secondary energy storage cell and also receptive of electrical energy from a source other than said secondary energy storage cell, said conditioning means providing electrical energy for energizing said gas producing means and also providing electrical energy to said secondary energy storage cell during said charging cycle, and further receiving electrical energy from said secondary energy storage cell during said discharging cycle.

4,534,834

PROCESS FOR CONTINUOUS PRETREATMENT BY ELECTROCHEMICAL OXIDATION OF STRIP OR FOIL OF ALUMINUM

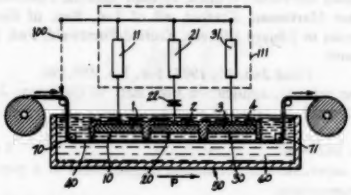
Maly Zdenek, Kreuzlingen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 9, 1984, Ser. No. 628,755

Claims priority, application Switzerland, Jul. 14, 1983, 3860/83

Int. Cl.³ C25D *5/02, 11/08*

U.S. Cl. 204—28 **14 Claims**



1. A process for pretreating an aluminum strip or foil by means of electrochemical oxidation for subsequent coating of same which comprises: providing an aluminum strip or foil; subjecting at least one side of said aluminum strip or foil to an electrochemical oxidation in a single electrolyte wherein said aluminum is subjected to a three phase alternating current, one phase of which is rectified, and said side passes sequentially three electrodes of which at least one is connected to the rectified phase while the others are connected to the other phases of the alternating current.

4,534,835

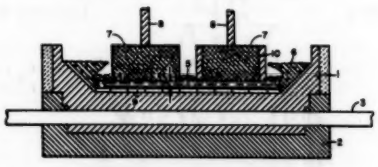
ELECTROLYTIC AL PRODUCTION WITH REACTION SINTERED MULTIPHASE CERAMIC

Thomas P. DeAngelis, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,674

Int. Cl.³ C25C *3/06*

U.S. Cl. 204—67 **20 Claims**



1. A component of an electrolytic aluminum production cell which in use is normally in contact with molten aluminum or in electrical contact with another component which is normally in contact with molten aluminum, characterized in that said component has a portion made of a reaction sintered ceramic consisting essentially of a fine-grained, homogeneous, intimate interdispersion of:

(a) 5–95 mole percent of nitride phase or phases having a maximum grain size not greater than about 10 μm and being nitride of one or both of Al and Si, and

(b) 5–95 mole percent of second phase or phases having a maximum grain size not greater than about 10 μm and being boride, carbide, silicide, sulfide or combination thereof of one or more of the elements of Groups 4b, 5 b and 6b;

said reaction sintered ceramic contains 0 to 4 weight precent oxygen and is prepared by the process comprising:

(c) admixing particulate reactants of maximum particle size not greater than about 150 μm and being elements, compounds, intermetallic compounds, alloys or combination thereof in stoichiometric proportions to form the nitride and second phases, and

(d) shaping and heating the admixture to form the reaction sintered ceramic, the heating being done in nonreactive atmosphere and at temperature at which the reaction and sintering occurs between the reactants to substantially form the nitride and second phases.

20. A method of producing aluminum by electrolysis in an electrowinning or electrorefining cell characterized by using a cell component as claimed in claim 1.

4,534,836

USE OF TEMPERATURE AND CORROSION RESISTANT GASTIGHT MATERIALS AS GUARD ELEMENTS FOR THE METAL PORTION OF COMBINATION ELECTRODES IN THE WINNING OF METALS BY MOLTEN SALT ELECTROLYSIS

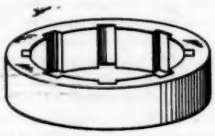
Dieter H. Zöllner; Christine Zöllner, both of Schwaig b. Nürnberg; Franz Schieber, Röthenbach an der Pegnitz; Inge Lauterbach-Dammler, Nuremberg, and Konrad Koziol, Röthenbach an der Pegnitz, all of Fed. Rep. of Germany, assignors to C. Conradty Nürnberg GmbH & Co., KG, Röthenbach a.d. Pegnitz, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,276

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1982, 3215537

Int. Cl.³ C25C *3/02, 3/04, 3/06, 7/00*

U.S. Cl. 204—67 **51 Claims**



1. In the winning of metals by electrolysis in a molten salt system, use of a combination anode having a metal shaft portion protected by guard elements in form of detachably mounted moldings consisting of a composite material comprising at least one ceramic oxide component and a carbon component containing structural elements of graphite.

4,534,837

PROCESS FOR THE MANUFACTURE OF AN ELECTRODE FOR ELECTROCHEMICAL PROCESSES AND A CATHODE FOR THE ELECTROLYTIC PRODUCTION OF HYDROGEN

Edgard Nicolas, Meise-Eversem, and Louis Merckaert, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed Jun. 19, 1984, Ser. No. 622,222

Claims priority, application France, Jun. 20, 1983, 83 10285

Int. Cl.³ C25B *1/02, 11/04*

U.S. Cl. 204—129 **11 Claims**

1. Process for the manufacture of an electrode for electrochemical processes, according to which an electrically conductive substrate is coated with a material containing a powder of at least one metal which is active for electrochemical proton reduction and the said material is heated on the substrate, successively in an oxidizing atmosphere and then in a reducing atmosphere, characterized in that a material is employed in which the abovementioned active metal is in the form of an unsintered powder, associated with colloidal silica.

4,534,838

SILOXANE POLYPHOTOINITIATORS OF THE SUBSTITUTED ACETOPHENONE TYPE

Samuel Q. S. Lin, Fort Lee, N.J., and Anthony F. Jacobine, Meriden, Conn., assignors to Loctite Corporation, Newington, Conn.

Continuation-in-part of Ser. No. 600,628, Apr. 16, 1984, abandoned. This application Sep. 27, 1984, Ser. No. 655,398

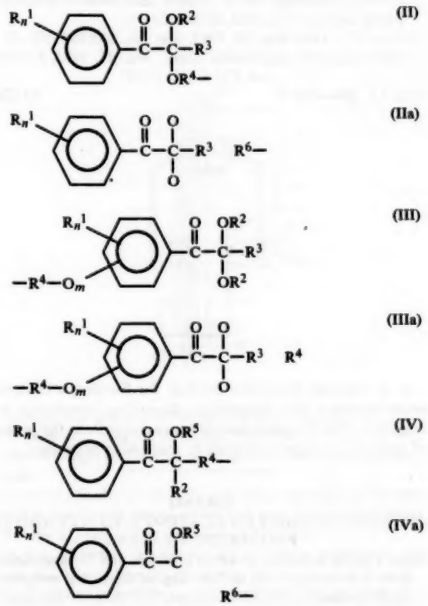
Int. Cl.³ C08F *2/46*

U.S. Cl. 204—159.13 **14 Claims**

1. An organopolysiloxane photoinitiator having an average of at least two siloxane units, of which at least an average of one siloxane unit per organopolysiloxane molecule has the formula:

$$X_aR_bSiO_{(4-a-b)/2} \quad (I)$$

wherein a is an integer of 1–3, b is an integer of 0–2 and a plus b equals 1–3; R is C_1–C_{10} hydrocarbyl or halogen substituted C_1–C_{10} hydrocarbyl; and X is a substituted acetophenone photomoiety selected from:



where R^1 is any substituent which will not interfere with hydrosilation, n is an integer between 0 and 5 in formulas (II), (IIa), (III), (IIIa), (IV) and (IVa) and between 0 and 4 in formula (III) and (IIIa); m is 0 or 1; R^2 is alkyl or substituted alkyl; R^3 is H, alkyl or aryl; R^4 is a divalent hydrocarbon group having between 2 and 10 carbon atoms or an alkylene oxy alkylene group; R^5 is a group selected from H, alkyl, aryl, organosilyl, or the reaction product of an isocyanate esterification reagent or an etherification reagent with the hydroxyl product formed when R^5 is H and R^6 is a trivalent hydrocarbon or hydrocarbon oxyhydrocarbon group.

4,534,839

PROCESS FOR THE PHOTOPOLYMERIZATION OF VINYL COMPOUNDS AND PHOTOPOLYMERIZABLE MATERIALS

Roland Schaefer, Friedrichsdorf, Fed. Rep. of Germany, assignor to Kulzer & Co. GmbH, Wehrheim, Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 413,804
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136484
Int. Cl.³ C08F 2/50
U.S. Cl. 204—159.23 9 Claims

1. In a process for the production of a dental composition by the photopolymerization of at least one vinyl monomer in the presence of a photoinitiator, the improvement comprising polymerizing said at least one vinyl monomer in the presence of a photoinitiator, the improvement comprising polymerizing said at least one vinyl monomer in the presence of a photoinitiator comprising:

(a) camphorquinone as a photosensitizer; and

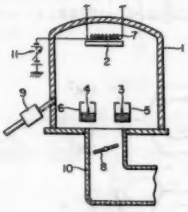
(b) at least one reducing agent selected from the group consisting of a 5-alkyl barbituric acid and a 5-aryl barbituric acid.

4,534,840

METHOD FOR FORMING A COMPOUND SEMICONDUCTOR FILM

Masanari Shindo, Hachioji; Shigeru Sato, Hino, and Akinari Kaneko, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Sep. 16, 1983, Ser. No. 532,758
Claims priority, application Japan, Sep. 27, 1982, 57-168101
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 R 10 Claims



1. A vacuum deposition method for forming a compound semiconductor film comprising, depositing compound semiconductor film forming materials on a substrate in the presence of sufficient ionized hydrogen to react with impurities.

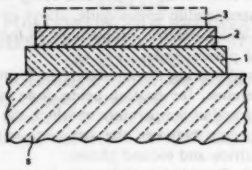
4,534,841

SOLAR CONTROLLED GLAZING AND METHOD OF PRODUCING GLAZING

Klaus Hartig, Ronneburg; Anton Dietrich, and Michael Scherer, both of Rodenbach, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 592,907
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311815
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 P 7 Claims

1. A method of producing glazing having a transmission of between 5 and 40% in the visual spectrum range and heat-reflection properties, comprising the steps of applying at least first and second coating layers to a transparent substrate by cathode sputtering, said first layer comprising an oxide layer having an optical thickness of between 20 and 280 nm and applied by cathode sputtering directly to the substrate in an oxygen-containing atmosphere, and said second layer comprising a chromium nitride layer having a geometric thickness of



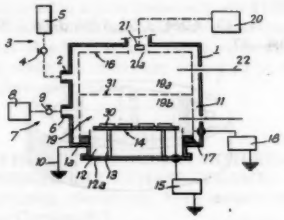
between 10 and 40 nm applied by cathode sputtering in an atmosphere consisting of an inert gas and nitrogen.

4,534,842

PROCESS AND DEVICE FOR PRODUCING A HOMOGENEOUS LARGE-VOLUME PLASMA OF HIGH DENSITY AND OF LOW ELECTRONIC TEMPERATURE

Yves Arnal, 44, Eybens; Jacques Pelletier, Saint Martin D'Heres, and Claude Pomot, La Tronche, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France

Filed Jun. 13, 1984, Ser. No. 620,136
Claims priority, application France, Jun. 15, 1983, 83 10116; Jun. 15, 1983, 83 10117
Int. Cl.³ C25B 11/04; C23C 15/00
U.S. Cl. 204—192 E 13 Claims



1. A process for producing a plasma of homogeneous large volume, of high density and of low electronic temperature, comprising the steps of:

maintaining a gaseous medium in an enclosure at a pressure in the range of 10^{-5} to 10^{-1} Torr;

exciting said gaseous medium in the enclosure by means of UHF waves in the range of one to ten gigahertz, producing a plasma; and

maintaining this plasma in the enclosure by means of a magnetic confinement shell comprising a plurality of elongated magnetic elements arranged parallel to each other inside the enclosure near the respective interior surfaces, the faces of alternate said magnetic elements which face the interior of the enclosure being of opposite polarity.

4,534,843

APPARATUS FOR ELECTROPLATING AND CHEMICALLY TREATING CONTACT ELEMENTS OF ENCAPSULATED ELECTRONIC COMPONENTS AND THEIR LIKE

Frank Johnson, San Jose; Dieter Reese, Simi Valley, and Louis Hirbour, Anaheim, all of Calif., assignors to Technic, Inc., Cranston, R.I.

Filed Jan. 28, 1983, Ser. No. 462,038
Int. Cl.² C25D 17/00, 17/06, 17/28; B05C 3/10
U.S. Cl. 204—202 16 Claims

1. An improved apparatus for electroplating projecting

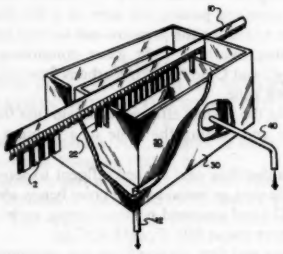
contact elements of encapsulated electronic components, and their like, comprising:

a continuous flexible conveyor belt of electrically conductive material;

guide means for said conveyor belt, constraining the motion thereof in a substantially horizontal plane, with a web of said conveyor belt in a substantially vertical alignment;

grip means, comprised of adjacent, multiply-bent elastic elements of alternatingly assymetrical shape, configured to frictionally engage portions of said contact elements therebetween, arrayed along the distal edge of said conveyor belt and in intimate, electrically conductive contact therewith;

drive means for said conveyor belt;



a plurality of containers for liquid treatment media disposed along the path of said conveyor belt, with at least one of said containers supplied with liquid electrolyte, each such container being provided with weirs in its upper edge adapted to pass the conveyor belt and encapsulated electronic components suspended therefrom inwardly and outwardly of the liquid contained in said tank;

recirculating means, for recovering liquid treatment media escaping from said containers through said weirs and returning such media to said containers, and

electroplating current supply means, including at least one electrode disposed within the liquid volume of said one container and at least one current transfer brush in contact with the conveyor belt, for supplying plating current for the deposition of a metallic substance from said electrolyte onto said contact elements.

4,534,844

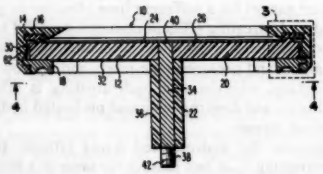
ELECTROFORMING APPARATUS

John J. Prusak, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 5, 1984, Ser. No. 678,480

Int. Cl.[3] C25D *1/10, 17/06*

U.S. Cl. 204—281 **4 Claims**



1. A cathode head assembly for holding a matrix of a given diameter comprising:

a disc-shaped support member having an outer diameter which is at least as large as the given diameter;

a circular seal member comprised of a compressable elastic material having an inside diameter less than the given diameter of the matrix and an outer diameter the same or less than the outer diameter of the support member, said seal member being positioned adjacent the outer diameter of the support member with the inner diameter edge being aligned to sealingly engage a matrix when positioned on the support member;

a ring member having a radially inwardly extending portion in engagement with the seal member and a downward extending cylindrical portion with an inside diameter larger than the outer diameter of the support member which is cylindrically aligned with the outer diameter of the support member; and

lock means associated with the ring member for holding the ring member in a position where the radially inwardly extending portion of the ring member holds the seal member in a compressed electrolyte tight sealing engagement.

4,534,845

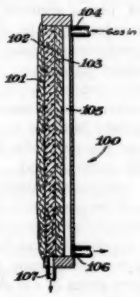
SEPARATOR-GAS ELECTRODE COMBINATION

James A. McIntyre, and Robert F. Phillips, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 404,690, Aug. 3, 1982, abandoned. This application Aug. 3, 1984, Ser. No. 637,456

Int. Cl.[3] C25B *1/46*

U.S. Cl. 204—283 **13 Claims**



1. A separator-gas electrode combination comprising:

(a) a separator adapted to permit the flow of fluids or ions therethrough and having at least a first and a second face; and

(b) a hydraulically permeable gas electrode adapted to permit a liquid and gas to enter and exit the electrode and having at least a first and second face; and

(c) a gas chamber contiguous to at least a portion of the second face of the gas electrode; and

(d) a means to introduce an oxygen-containing gas into said gas chamber; and

(e) an electrically non-conductive self-draining member having a fluid outlet opening external to the separator-gas electrode combination and at least two faces, at least a portion of a first face being contiguous to at least a portion of one face of the separator, and at least a portion of a second face being contiguous to at least a portion of the first face of the gas electrode; said member having a plurality of interconnected passageways in fluid-transferring communication with the separator, the gas electrode and the fluid outlet and providing the major conduit therebetween.

4,534,846
ELECTRODES FOR ELECTROLYTIC CELLS

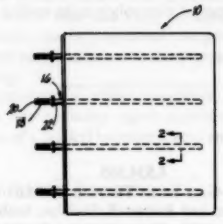
Kenneth E. Woodard, Jr., Cleveland, Tenn., and Ronald L. Dotson, Cheshire, Conn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 518,595, Jul. 29, 1983, Pat. No. 4,513,904, which is a division of Ser. No. 490,612, May 2, 1983, Pat. No. 4,452,685. This application Nov. 23, 1984, Ser. No. 674,373

The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

Int. Cl.³ C25B *11/00*; C25C *7/02*

U.S. Cl. 204—290 R **16 Claims**



1. An electrode for use in an electrolytic cell having cell electrolyte flowing through the cell, comprising in combination:

(a) a generally flat, planar conductor plate connectable to an electrical connection supplying electrical current having a contact surface;

(b) a generally flat, planar element fastened to at least a portion of the conductor plate, the element being of a material that is corrosion-resistant to the cell electrolyte and having a contact surface;

(c) conducting means fastened to the generally flat, planar element of corrosion-resistant material;

(d) an electrode surface fastened to the conducting means spaced apart from the generally flat, planar element of corrosion-resistant material; and

(e) an electrically conductive coating in contact with the contact surfaces of the conductor plate and the generally flat, planar element of corrosion resistant material immediately in line and opposite the conducting means, the electrically conductive coating being a liquid-metal mixture comprising between about 20 and about 30 percent indium by weight and between about 80 and about 70 percent gallium by weight such that the electrical contact resistance between the conductor plate and the generally flat, planar element of corrosion resistant material is reduced.

4,534,847
PROCESS FOR PRODUCING LOW-SULFUR BOILER FUEL BY HYDROTREATMENT OF SOLVENT DEASHED SRC

George W. Roberts, Emmaus, and John C. Tao, Perkiomenville, both of Pa., assignors to International Coal Refining Company, Allentown, Pa.

Filed Jan. 16, 1984, Ser. No. 571,311

Int. Cl.³ C10G *1/00, 1/06*

U.S. Cl. 208—8 LE **4 Claims**

1. An improved process for producing a substantially ash-free, low-sulfur solid boiler fuel by hydrotreating deashed solvent refined coal wherein hydrogen consumption and the occurrence of coking in said hydrotreating step are minimized, said process comprising:

(a) mixing finely divided coal with a hydrogen donor solvent for the hydrocarbonaceous material in said coal, said solvent having a boiling range of about 400° F. to 850° F. (204.4° to 454.4° C.), to form a slurry,

(b) pressurizing said slurry to a pressure of between 500 and 3000 psig (70.3 to 210.8 kg/cm^2 gauge),

(c) adding a gas comprising molecular hydrogen to the pressurized slurry to form a hydrogen-containing slurry having a hydrogen/coal weight ratio of about 0.025 to 0.15,

(d) preheating said hydrogen-containing slurry to about 750° F. (398.9° C.),

(e) passing the heated hydrogen-containing slurry to a dissolving zone having an outlet temperature in the range from about 750° F. to 900° F. (398.9° to 482.2° C.),

(f) maintaining said heated hydrogen-containing slurry in said dissolving zone for a residence time of about 2 to 120 minutes,

(g) removing the treated slurry as effluent from said dissolving zone and passing the same to a first flash separating zone to reduce the pressure and to cool said effluent,

(h) removing overhead light gases comprising H_2, H_2S, NH_3, H_2O and C_1 to C_4 hydrocarbons from said first flash separating zone,

(i) removing the flashed effluent from said first flash separating zone and passing the same to a vacuum distillation zone,

(j) vacuum distilling said flashed effluent to separate a first portion having an initial boiling point below about 850° F. (454.4° C.) and a second portion having an initial boiling point above about 850° F. (454.4° C.),

(k) removing said first portion from said vacuum distillation zone and passing the same through a distillation zone to separate a light distillate fraction and a process derived solvent fraction,

(l) removing said second portion from said vacuum distillation zone and passing the same through a critical solvent deashing zone to produce deashed solvent refined coal having a boiling point greater than 850° F. consisting predominantly of asphaltenes and preasphaltenes and having a hydrogen content of less than 6.5% and ash concentrate comprising solid ash and undissolved coal,

(m) removing said deashed solvent refined coal having a boiling point greater than 850° F. consisting predominantly of asphaltenes and preasphaltenes and having a hydrogen content of less than 6.5% from said critical solvent deashing zone and combining same with at least a portion of said process solvent from said first distillation zone to produce a hydrotreater feedstock stream,

(n) pressurizing said hydrotreater feedstock stream with hydrogen and adjusting the temperature of said stream to from about 400° F. to 800° F. (204.4° to 426.7° C.),

(o) passing said preheated hydrotreater feedstock stream containing said preasphaltenes and asphaltenes to a hydrotreating zone containing a sulfided hydrotreating catalyst at hydrogenation conditions including a temperature of from 650° F. to 850° F. (343.3° to 454.4° C.) and a pressure ranging from about 1000 to 2500 psig (70.3 to 175.7 kg/cm^2 gauge) for a sufficient time effective to produce a liquid hydrotreating effluent containing a solid boiler fuel at room temperature, without substantial reduction in said asphaltene and preasphaltene levels and without substantial coking, wherein said hydrotreating is effective to desulfurize and denitrogenate said preheated hydrotreated feedstock stream,

(p) removing the hydrotreated liquid effluent from said hydrotreating zone and passing the same to a second flash separating zone to reduce the pressure and temperature of said effluent and to separate light gases therefrom and,

(q) removing the remaining portion of the flashed hydrotreated liquid effluent from said second flash separating zone and passing the same to a second distillate zone to separate a second light distillate stream, a second recycle solvent stream and a substantially ash-free low sulfur solid boiler fuel.

4,534,848

COAL LIQUEFACTION WITH A SELENIUM CATALYST

Yuzo Sanada; Susumu Yokoyama, both of Sapporo; Tadatoshi Chiba, Ishikari; Tetsuro Yokono, Sapporo; Hiroshi Moritomi, Sapporo; Toshiyuki Obara, Sapporo, and Hiroshi Nagaishi, Sapporo, all of Japan, assignors to Hokkaido University, Sapporo, Japan

Filed Nov. 13, 1984, Ser. No. 671,045
Claims priority, application Japan, Jan. 26, 1983, 58-11146
Int. Cl.[3] C10G 1/00
U.S. Cl. 208—10 5 Claims

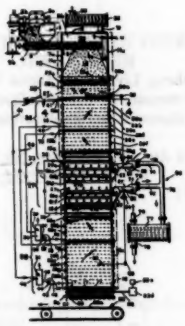
1. A method for the direct liquefaction of coal, comprising heating powdered coal, a catalyst, and hydrogen to a temperature of 400°-470° C. under a pressure of 1 to 200 atms wherein said catalyst consists of selenium, a compound of selenium, or a mixture of selenium or the compound of selenium with a metal oxide.

4,534,849

METHOD FOR ABOVEGROUND SEPARATION, VAPORIZATION AND RECOVERY OF OIL FROM OIL SHALE

Ray C. Edwards, Kinnelon, N.J., assignor to Edwards Engineering Corporation, Pompton Plains, N.J.

Continuation-in-part of Ser. No. 508,738, Jun. 29, 1983, abandoned, Division of Ser. No. 457,975, Jan. 14, 1983, Pat. No. 4,502,920. This application Aug. 20, 1984, Ser. No. 642,084
Int. Cl.[3] C10G 1/02, 1/00
U.S. Cl. 208—11 R 8 Claims



1. A method of recovering hydrocarbons from oil shale including the steps of:

a. crushing said oil shale to an approximate predetermined size,

b. delivering said oil shale to an elongated housing for controlled movement through a transfer passage extending end to end therethrough.

c. moving the crushed oil shale through a drying zone in the transfer passage and heating the same within a first temperature range.

d. moving the crushed oil shale from the drying zone to a preheating zone in the transfer passage which follows the drying zone and heating the same within a second temperature range higher than said first temperature range,

e. moving the crushed oil shale through a cracking and distillation zone in the transfer passage which follows the preheating zone and heating the crushed oil shale in said cracking and distillation zone within a third temperature range higher than said second temperature range and to a temperature above the critical temperature for releasing hydrocarbon in vapor form from the crusher oil shale,

f. separating the hydrocarbon vapors from the crushed oil shale therein by pump means,

g. condensing the hydrocarbon vapors and passing the same to any suitable point of storage,

h. moving the crushed oil shale from the cracking and distillation zone to a waste heat recovery zone in the transfer passage which follows the cracking and distillation zone to recover waste heat from the spent crushed oil shale and utilizing the recovered waste heat for preheating the incoming crushed oil shale.

i. removing the spent oil shale from the transfer passage in the elongated housing,

j. sensing the pressure within said elongated housing on opposite sides of said cracking and distillation zone, and

k. adjusting the pressure in said cracking and distillation zone by regulating the pump means in response to the sensed pressures to a pressure greater than the pressures in the other zones such that substantially all hydrocarbon vapors are separated by said pump means and such that gases in said adjacent zones do not enter into said cracking and distillation zone.

4,534,850

OPTICALLY ANTISOTROPIC CARBONACEOUS PITCH

Takayuki Izumi; Tsutomu Naito, and Tomoo Nakamura, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 321,597, Nov. 16, 1981, abandoned. This application Apr. 22, 1983, Ser. No. 487,700
Claims priority, application Japan, Nov. 19, 1980, 55-162972
Int. Cl.[3] C10C 3/00
U.S. Cl. 208—22 12 Claims

1. An improved spinnable optically anisotropic carbonaceous pitch having above about 90% of an optically anisotropic phase and a softening point in the range of about 230° C. to about 320° C., said pitch comprising:

(a) about 2 to 20 percent by weight of a first n-heptane-soluble component, said first component having a carbon-hydrogen atomic ratio of at least 1.3, a ratio of carbon atoms in the aromatic structure to the total carbon atoms of at least 0.8, a number average molecular weight of greater than 1000 and a molecular weight of not less than 150;

(b) about 15 to 45 percent by weight of a second n-heptane-insoluble and benzene-soluble component, said second component having a carbon-hydrogen atomic ratio of at least 1.4, a ratio of carbon atoms in the aromatic structure to the total carbon atoms of at least 0.8, a number average molecular weight of no greater than 2000 and a molecular weight of no greater than 10,000;

(c) about 5 to 55 percent of a third benzene-insoluble quinoline-soluble component, said third component having a carbon-hydrogen atomic ratio of at least 1.5, a ratio of carbon atoms in the aromatic structure to the total carbon atoms of at least 0.8, a number average molecular weight of no greater than 2000 and a molecular weight no higher than 10,000;

(d) about 20 to 70 percent by weight of a benzene-insoluble and a quinoline-insoluble fourth component having a carbon hydrogen ratio of at least 1.8, a ratio of carbon atoms in the aromatic structure to the total carbon atoms of at least 0.85, a number average molecular weight of no greater than 3000 and a molecular weight no higher than 30,000.

4,534,851

FEED INJECTION METHOD TO PREVENT COKING ON THE WALLS OF TRANSFER LINE REACTORS

David E. Allan, and Charles H. Martinez, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 2, 1983, Ser. No. 500,408
Int. Cl.³ C10G 9/12, 9/16
U.S. Cl. 208—48 R **6 Claims**

1. A method of introducing a hydrocarbonaceous liquid feed into a transfer line reaction zone, which comprises:

introducing said hydrocarbonaceous liquid feed and steam into said transfer line reaction zone as separate concentric streams, said hydrocarbonaceous feed being introduced into a conduit disposed in inner concentric relation to an outer conduit, and said steam being introduced into said outer conduit, discharging a first portion of said steam as a stream directed towards an inner wall of said transfer line reaction zone through a nozzle positioned on said outer conduit to cover at least a portion of said inner wall of said transfer line reaction zone with said first portion of steam, and discharging said hydrocarbonaceous liquid feed and a second portion of said steam in a direction parallel to the longitudinal axis of said transfer line reaction zone through outlets comprised by said outer conduit and said inner conduit.

4,534,852

SINGLE-STAGE HYDROTREATING PROCESS FOR CONVERTING PITCH TO CONVERSION PROCESS FEEDSTOCK

Don M. Washecheck, Katy, and Charles T. Adams, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Nov. 30, 1984, Ser. No. 676,742
Int. Cl.³ C10G 45/06
U.S. Cl. 208—89 **17 Claims**

1. A process for converting residual hydrocarbon oils to catalytic cracking feedstocks which comprises:

mixing from about 5–60%v residual oils with catalytic cracking feedstock and hydrogen and passing said mixture downwardly into a hydrotreating zone over a stacked-bed of two hydrotreating catalysts under conditions suitable to convert from about 45–75% of the sulfur compounds present to H_2S; said stacked bed comprising an upper bed consisting of about 15–85%v, basis total catalyst, of a high-activity hydrotreating catalyst containing from about 2–4%w nickel, from about 8–15%w molybdenum and from about 2–4%w phosphorus supported on a carrier consisting mostly of alumina, said catalyst having a compacted bulk density of about 0.7–0.95 gm/cc and a surface area greater than 140 m^2/gm; and a lower bed consisting of about 15–85%v, basis total catalyst, of a high-activity desulfurization catalyst which contains from about 2–4%w cobalt and/or nickel and from about 8–15%w molybdenum and less than about 0.5%w phosphorus supported on a carrier consisting mostly of alumina, said catalyst having a compacted bulk density of about 0.6–0.8 gm/cc and a surface area greater than 180 m^2/gm; and separating the reaction product from said hydrotreating zone into a hydrogen-rich gas and a liquid residue-containing oil having reduced sulfur and/or heavy metal content and being suitable as a catalytic cracking feedstock.

4,534,853

METHOD FOR CRACKING RESIDUAL OILS

Gary N. Long, Putnam Valley; Regis J. Pellet, Croton-on-Hudson, and Jule A. Rabo, Armonk, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 19, 1983, Ser. No. 543,359
Int. Cl.³ C10G 11/02, 11/04
U.S. Cl. 208—120 **26 Claims**

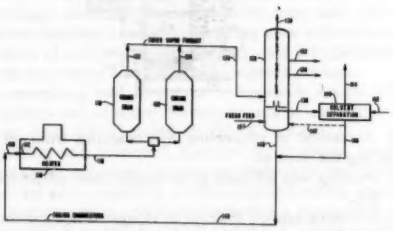
1. In a method for converting hydrocarbons comprising residual oils which comprises charging hot particles of catalyst at a temperature above 1400° F. and at least equal to the pseudo-critical temperature of a hydrocarbon feed comprising residual oils to the lower portion of a riser conversion zone for flow upwardly therethrough, charging the hydrocarbon feed comprising residual oils to said riser conversion zone as a multiplicity of separate streams so as to substantially completely vaporize vaporizable components of the feed whereby thermal and catalytic cracking of the feed is accomplished and recovering a hydrocarbon product of said thermal and catalytic cracking of the feed separate from catalyst particles the improvement comprising employing a catalyst comprising a zeolitic aluminosilicate selected from the group consisting of LZ-210, LZ-210-M, LZ-210-T, LZ-210-A and mixtures thereof.

4,534,854

DELAYED COKING WITH SOLVENT SEPARATION OF RECYCLE OIL

Harold N. Weinberg, Livingston; David W. Savage, Lebanon, and Walter Weissman, Berkeley Heights, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 17, 1983, Ser. No. 523,962
Int. Cl.³ C10G 9/14
U.S. Cl. 208—131 **8 Claims**



1. A delayed coking process which comprises the steps of:

(a) preheating a hydrocarbonaceous oil chargestock to a coking temperature;

(b) introducing the resulting preheated oil chargestock into a coking zone at delayed coking conditions to form coke and a vapor phase product, including light and heavy normally liquid hydrocarbons;

(c) separating at least a portion of said heavy hydrocarbons from said vapor phase product in a separation zone wherein a fresh hydrocarbonaceous oil is introduced, said separated heavy hydrocarbons having a Conradson carbon content ranging from about 3 to about 50 weight percent;

(d) removing at least a portion of said heavy hydrocarbons from said separation zone of step (c) as a sidestream above the location of the introduction of said fresh oil into said

separation zone of step (c) to prevent said portion of heavy hydrocarbons from mixing with said fresh oil;

(e) subsequently contacting at least a portion of said separated hydrocarbons, said portion of separated hydrocarbons having a Conradson carbon content of about 3 to about 50 weight percent, with a solvent in a solvent separation zone at separation conditions to separated said heavy hydrocarbons into a high Conradson carbon hydrocarbonaceous product and a low Conradson carbon hydrocarbonaceous product;

(f) recycling at least a portion of said high Conradson carbon hydrocarbonaceous product from said separation zone to said preheating zone of step (a);

(g) passing at least a portion of said hydrocarbonaceous oil from said separation zone of step (c) to said pre-heating zone of step (a), and

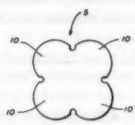
(h) recovering said low Conradson carbon hydrocarbonaceous product of step (e).

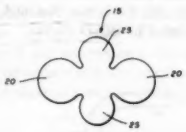
4,534,855

SHALE OIL DEMETALLIZATION PROCESS

Michael A. Silverman, Houston, Tex., assignor to Tenneco Oil Company, Houston, Tex.

Filed Jan. 3, 1983, Ser. No. 454,740
Int. Cl.³ C10G *25/00, 45/60*
U.S. Cl. 208—253 **20 Claims**





1. The method of removing trace metals from a hydrocarbonaceous oil comprising,

(a) contacting a hydrocarbonaceous oil containing trace amounts of a metal selected from the group consisting of As, Fe, Ni and mixtures thereof with a bed of polylobe contact structures consisting essentially of unmodified alumina at a temperature in the range 500° F. to 700° F., and

(b) recovering said hydrocarbonaceous oil having a substantial portion of said trace metal removed from said oil wherein said method is characterized in that the presence or absence of hydrogen or nitrogen process gas produces substantially the same level of trace metal removal.

4,534,856

ELECTRODYNAMIC METHOD FOR SEPARATING COMPONENTS

Louis C. Weiss, and Devron P. Thibodeaux, both of Metairie, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

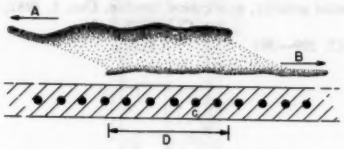
Filed Aug. 30, 1983, Ser. No. 527,730
Int. Cl.³ B03C *7/00*
U.S. Cl. 209—1 **8 Claims**

1. An electrodynamic method for separating components of agricultural by-products comprising:

(a) feeding onto a horizontal electric undulating traveling wave contact panel an agricultural by-product mixture comprising individual components that can be differentially charged;

(b) energizing the panel with sufficient charging voltage for sufficient time to impart different charge to mass ratios to the individual components;

(c) increasing the voltage to a separation voltage for sufficient time to effect separation of the components, said



separation voltage being that which is sufficient to move said components, in opposite directions but less than that voltage which is necessary to transport all of the components in the same direction;

(d) separating the individual components by cyclically repeating steps (b) and (c) until all of the components are moved off of the panel for recovery.

4,534,857

ORE FLOTATION WITH COMBINED COLLECTORS

Robert M. Parlman, and Clarence R. Bresson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 584,673, Feb. 29, 1984, and Ser. No. 409,254, Aug. 18, 1982, Pat. No. 4,462,898. This application Dec. 7, 1984, Ser. No. 679,655
Int. Cl.³ B03D *1/14*
U.S. Cl. 209—166 **9 Claims**

1. A composition comprising a mixture which contains both of the following compounds in substantial quantities

(a) S-allyl-S'-n-butyl trithiocarbonate

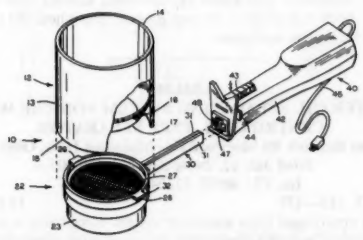
(b) N,N-dimethyl-S-benzyl dithiocarbamate.

4,534,858

SIFTER

Warren S. Aldrich, 1965 Old Dominion Dr., Dunwoody, Ga. 30338, and Brian Ingersoll, Marietta, Ga., assignors to Warren Aldrich, Dunwoody, Ga.

Filed Jun. 4, 1984, Ser. No. 616,905
Int. Cl.³ B07B *1/02, 1/28*
U.S. Cl. 209—236 **8 Claims**



1. A sifter comprising a casing, a screen mounted to said casing through which material introduced into said casing may be sifted, and a handle mounted to said screen having an end portion provided with coupling means for coupling said handle with an electric knife drive means of the type having two juxtaposed drive rods such that said screen may be driven by said drive means with a generally linear, reciprocating movement, and wherein said handle end portion is bar-shaped, one

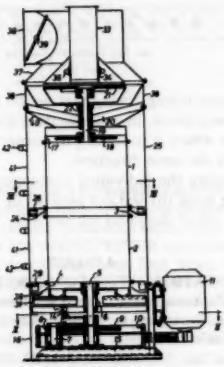
side of which is completely flat and the other side of which has a stud projecting outwardly therefrom.

4,534,859

CLEANING MACHINE WITH A VERTICAL CYLINDER SCREEN

Ingmar Andrén, Lindesberg, Sweden, assignor to Lindema Kommanditbolag, Lindesberg, Sweden

Filed Nov. 21, 1983, Ser. No. 553,721
Claims priority, application Sweden, Dec. 1, 1982, 8206874
Int. Cl.³ B07B *1/26*
U.S. Cl. 209—301 **19 Claims**



1. A cleaning machine comprising
a center shaft (5),
a vertical cylinder screen (1–3) connected to said center shaft for rotation with said center shaft,
a driven eccentric means connected to said center shaft to give said screen an oscillatory angular motion,
carrier means mounted for rotation about said center shaft to give a rotary motion to said vertical cylinder screen,
said carrier means including a disc (10) which is rotatable about said center shaft and having a driving means (11) connected to said disc to rotate said disc,
said driven eccentric means including
an eccentric unit shaft (7) carried by said disc for rotation relative to said disc,
an eccentric (12) on said eccentric unit shaft,
a gearwheel (8) fixedly mounted on said eccentric unit shaft, and
a stationary gearwheel (9) mounted around said center shaft in a position to engage said gearwheel (8) on said eccentric unit shaft.

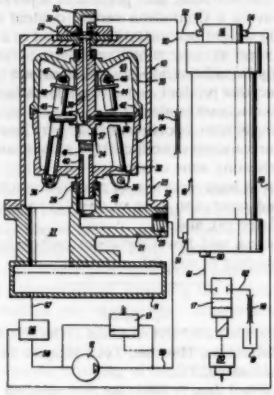
4,534,860

WATER-OIL SEPARATING SYSTEM FOR USE WITH CENTRIFUGAL TYPE SEPARATOR

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Filed Jul. 11, 1984, Ser. No. 629,907
Int. Cl.³ B01D *33/04*; B04B *9/06*
U.S. Cl. 210—137 **12 Claims**

1. A centrifugal filter separator system comprising a stationary housing having an inlet port supplied with pressurized oil by a pump having a suction port connected to a reservoir, a clean oil outlet port connected to said reservoir, a centrifuged water port, and a rotatable drum journalled in said housing and functionally connected with said inlet port, said clean oil outlet port and said centrifuged water port, gravity type separating means having flow resistance means interconnected to said centrifuged water port, pressurizing means of said gravity type separating means operable to maintain a relatively constant pressure differential across said flow resistance means and oil conducting means down stream of said pressurizing means interconnected to exhaust means whereby oil-water mixture



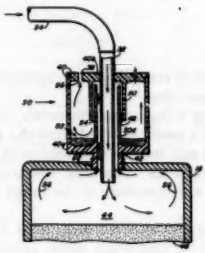
supplied from said centrifuged water port can be separated into oil and water, said water retained in said gravity type separator and said oil returned to said exhaust means.

4,534,861

VACUUM PUMP PURGING APPARATUS

Robert C. Wedemeyer, San Francisco, and Robert H. Giebeler, Jr., Cupertino, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 30, 1984, Ser. No. 605,340
Int. Cl.³ B01D *45/06*
U.S. Cl. 210—168 **19 Claims**

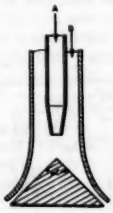


1. An apparatus for purging contaminating liquids from a vacuum pump of the type having a housing that encloses an oil sump, comprising:
(a) a separator for collecting said liquids from the pump housing including:
(i) a purging air inlet,
(ii) a purged air inlet,
(iii) a purged air outlet, and
(iv) a liquid trap connected between the purged air inlet and the purged air outlet,
(b) first means for connecting the purging air inlet and purged air inlet in fluid communication with the pump housing, and
(c) second means for connecting the purging air inlet to a source of purging air.

4,534,862
APPARATUS FOR FLOTATION

Marko Zlokarnik, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 406,692, Aug. 9, 1982, abandoned, which is a continuation of Ser. No. 236,485, Feb. 23, 1981, abandoned. This application Aug. 9, 1983, Ser. No. 521,775
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008476
Int. Cl.³ C02F *1/24*
U.S. Cl. 210—221.2 **2 Claims**



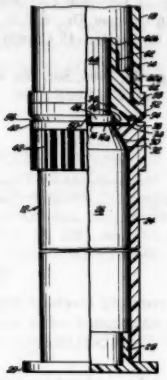
1. In a flotation cell including means for dispensing a gas in a liquid, such means comprising a liquid propulsion jet nozzle arranged axially inside a gas-providing tube, the nozzle and tube ending in a funnel-shaped mixing chamber, the mixing chamber being formed by a funnel-shaped casing containing a conical deflecting element arranged in line with the axis of the propulsion jet, thereby forming an annular passage, the improvement wherein the funnel has a concave curvature over its entire length and the angle of the conical deflecting element is between 60° and 120° such that the annular passage has a first zone of decreasing cross-section followed by a second zone of increasing cross-section in the flow direction, wherein the ratio of diameter of the conical deflecting element (d_1) to the diameter of the jet nozzle (d) is more than 3, and wherein the jet nozzle diameter (d) is at least 10 mm and the width of the annular passage at the increasing cross-section (h) is at least 5 mm, whereby the nozzle acts as a confuser in the first zone and a diffuser in the second zone to obtain high self-aspirated gas throughputs.

4,534,863
CENTRIFUGAL FILTERING DEVICE AND FILTER UNIT THEREFOR

David L. Bacon; Richard D. Kremer, and Randall H. Morse, all of Keene, N.H., assignors to Schleicher & Schuell, Inc., Keene, N.H.

Filed May 22, 1984, Ser. No. 612,905
Int. Cl.³ B01D *25/02*
U.S. Cl. 210—232 **24 Claims**

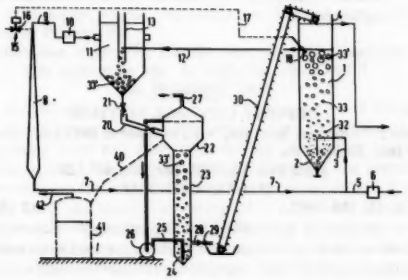
1. A centrifugal filtering device, comprising:
(a) a generally cylindrical sample tube having an open inlet end and an open outlet end;
(b) a filter support element ultrasonically welded to the outlet end of the sample tube at an annuular joint and defining an open-ended passage coaxial with the sample tube, said support element having a forward end formed with an annular seat surrounding said passage;
(c) a filter clamped between the outlet end of the sample tube and the support element for completely occluding said passage such that liquid can enter said passage from said sample tube only by passing through said filter;
(d) a receiver vessel having an open inlet end removably mounted on said seat, and a closed outer end, for collecting and retaining liquid advancing forwardly through said passage from said filter; and
(e) a cap for closing the inlet end of said sample tube;
(f) said annular joint being sufficiently mechanically weaker than said sample tube and said filter support element to enable the sample tube and the support element to be separated by application of manual bending forces at said joint for recovering said filter.



4,534,864
PROCESS AND DEVICE FOR THE REGENERATION OF A GROUP OF SOLID PARTICLES HAVING A COATING OF A BIOLOGICAL MATERIAL

Alain Rigouard, Echirolles, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Apr. 17, 1984, Ser. No. 601,333
Claims priority, application France, Apr. 28, 1983, 83 07016
Int. Cl.³ C02F *3/28, 3/30*
U.S. Cl. 210—603 **7 Claims**



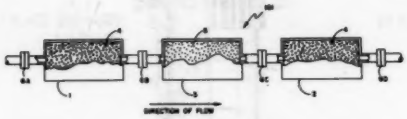
1. A process for regenerating a group of solid particles provided with a coating of biological material by substantially eliminating said coating of biological material, said process comprising producing and anaerobically fermenting the coating of said particles in a bed fluidized in an ascending current of liquid, degassing at an upper end of said bed a gaseous mixture comprising essentially methane and carbon dioxide resulting from said fermentation, and recovering at a lower end of said bed the regenerated solid particles from which their coating of biological materials has been substantially removed.

4,534,865

METHOD AND APPARATUS FOR REDUCING LEVELS OF ORGANICS IN LIQUIDS

Donald C. Sundberg, 21 Garrison La., Madbury, N.H. 03820; Paul L. Bishop, 16 Granger Dr., R.F.D. #1, Durham, N.H. 03824, and David G. McBee, 15 Cardiff Rd., Nashua, N.H. 03062

Filed Apr. 24, 1984, Ser. No. 604,571
Int. Cl.[3] C02F 1/28
U.S. Cl. 210—692 10 Claims



1. Apparatus for reducing levels of organic contaminants present in flowing contaminated water and for automatically terminating the flow of the contaminated water, which comprises:

a. a first activated carbon bed and a second activated carbon bed serially connected and spaced from one another to receive contaminated water, adsorb organic contaminants therein, and then pass the cleaned water therethrough, and

b. absorption means comprising an absorption bed of given volume disposed between the first activated carbon bed and the second activated carbon bed, responding, upon being exposed to organic contaminants in the water, by absorbing any contaminants that pass through the first activated carbon bed and swelling within said given volume because of the absorption of the contaminants to decrease flow of contaminated water from the first activated carbon bed to the second activated bed and ultimately to fill the given volume and terminate the flow of the contaminated water, the relative volumes of the serially connected spaced activated carbon beds and the absorption bed being chosen to provide proper residence times for the water in the spaced activated carbon beds and a proper expansion time for the particles in the absorption bed to decrease the flow and ultimately to terminate the flow from the first activated carbon bed to the second activated carbon bed upon exhaustion of the first activated carbon bed.

4,534,866

DEPOSIT CONTROL METHOD

Larry W. Becker, Syracuse, N.Y., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Feb. 17, 1983, Ser. No. 467,528
Int. Cl.[3] C02F 5/14
U.S. Cl. 210—697 11 Claims

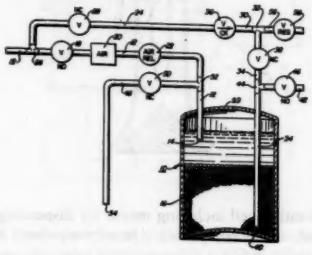
1. Method of controlling the deposition of calcium phosphate on the structural parts of a system exposed to an aqueous medium prone to said deposition, said aqueous medium comprising a calcium ion concentration of about 400 ppm calcium (as Ca^{+2}) and greater, said method comprising adding to said aqueous medium an effective amount for the purpose of a water soluble reaction product formed from acrylic acid, an hydroxylated lower alkyl acrylate and hypophosphorous acid, the molar ratio of acrylic acid:hydroxylated lower alkyl acrylate:hypophosphorous acid being about 3: about 1: about 1, and the number average molecular weight of said reaction product being about 4,400, said water soluble reaction product being capable of controlling said calcium phosphate deposition without resulting in substantial adduct formation with said calcium.

4,534,867

SYSTEM FOR REMOVING IRON AND/OR OTHER CHEMICALLY REDUCING SUBSTANCES FROM POTABLE WATER

Edward G. Kreusch, Arlington Heights, and Bruce F. Brodzik, Mundelein, both of Ill., assignors to Culligan International Company, Northbrook, Ill.

Continuation-in-part of Ser. No. 525,966, Aug. 24, 1983, abandoned, which is a continuation-in-part of Ser. No. 502,238, Jun. 8, 1983, abandoned. This application Mar. 16, 1984, Ser. No. 590,575
Int. Cl.[3] C02F 1/64
U.S. Cl. 210—722 7 Claims



1. A process for removing iron and other chemically reducing substances from potable water having a pH between 5 and 9, which comprises the steps of:

providing a tank for receiving all of the potable water to be treated, said tank containing a bed of granular activated carbon;

aerating the water with an air pump prior to its communication with the granular activated carbon;

directing all of the aerated water into said tank to introduce the aerated water to said bed of granular activated carbon, whereby the activated carbon provides a catalytic action so that substantially all of the oxidation occurs throughout the bed of activated carbon and the use of chemical oxidizing agents is obviated and the need for a detention tank is obviated; and

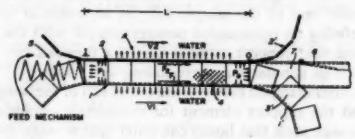
removing excess gas from the aerated water prior to its communication with the activated carbon.

4,534,868

SYSTEM AND METHOD FOR EXTRACTING LIQUID FROM A HUMID MASS BY COMPRESSION

Adrian Barbulescu, Ste-Foy; Rodrique Boulet, Duberger, and Denis Lessard, Ste-Foy, all of Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed May 12, 1983, Ser. No. 493,811
Claims priority, application Canada, Jun. 1, 1982, 404223
Int. Cl.[3] B01D 33/00
U.S. Cl. 210—780 23 Claims



1. A system for extracting liquid from a humid mass, said system comprising a conduit having an inlet end for admitting a humid mass therein as a continuous stream, said conduit having perforations in at least a working section of said conduit, means to gradually and progressively create an axial pressure at the interior of said humid mass, said conduit having

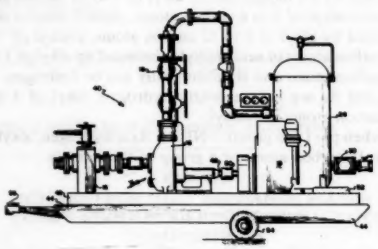
a movable side wall section having a surface area greater than the surface area of the remaining side wall section, means to impart continuous movement to said movable side wall so that said movable side wall is displaced axially along at least said working section of said conduit for displacing a humid mass axially along at least said working section of the conduit, said movable side wall section creating a dynamic friction force between the inner surface of the conduit and the humid mass to define a pressure zone which is inferior to said axial pressure whereby to establish a differential pressure through said mass to cause liquid therein to flow out of said mass transversely to the direction of travel of said mass and out of said conduit through said perforated section, said conduit having an outlet end through which there is discharged a continuous output of said humid mass containing only a small percentage of liquid therein.

4,534,869

PORTABLE WATER FILTRATION SYSTEM FOR OIL WELL FRACTIONATION

Darrel L. Seibert, 3724 Country Club Dr., Cuyahoga Falls, Ohio 44224

Filed May 9, 1983, Ser. No. 492,877
Int. Cl.³ B01D *37/00*
U.S. Cl. 210—788 **7 Claims**



1. A portable water filtration apparatus for filtering water used in oil well processes comprising:

a duplex strainer;

a self priming centrifugal pump having its suction side in communication with said strainer and having a pinch valve to control flow;

a centrifugal separator connected to the discharge side of said pump;

a cartridge filter connected to the discharge side of said centrifuge; and

a trailer with wheels and upturned bow at either end with the capability to travel over any type of terrain by being towed in typical fashion or dragged in sled-like fashion;

wherein said strainer, pump, separator and cartridge filter are mounted on said trailer;

wherein said pump is powered by an engine using a flexible, direct drive means;

wherein the apparatus filters from about 250 to about 300 gallons per minute of water, the average particle size of particulate matter in said filtered water being less than 5 microns; and

wherein said strainer, pump, separator and cartridge filter are carefully matched and arranged to enable the filtration system to attain maximum and eliminate particulates down to 5 microns.

6. A portable method for filtering water used in oil well processes comprising:

straining particulate matter in water from a nurse tank to three-eights of an inch in a duplex strainer;

pumping said water with a centrifugal pump at a rate from about 250 to about 300 gallons per minute from said strainer;

centrifuging said water from said pump in a centrifugal separator, reducing the particle size of said matter to 50 microns;

filtering said water from said separator in a cartridge filter, reducing the particle size of said matter to 5 microns; and

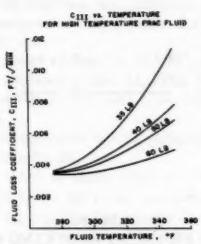
means for transporting an apparatus which embodies said method over any type of terrain to almost any location either easily accessable or accessable with difficulty.

4,534,870

CROSSLINKER COMPOSITION FOR HIGH TEMPERATURE HYDRAULIC FRACTURING FLUIDS

Dennis A. Williams, Fort Worth, Tex., assignor to The Western Company of North America, Fort Worth, Tex.

Filed Jun. 28, 1982, Ser. No. 392,602
Int. Cl.³ C09K *3/00*; E21B *43/16, 43/26*
U.S. Cl. 252—8.55 R **18 Claims**



11. An improved high temperature, high pH, water-based fracturing fluid incorporating a polysaccharide polymer, buffer, crosslinker, pH adjusting agent and antioxidant wherein the improvement comprises a crosslinker comprised of a zirconium/triethanolamine complex having a Zr/TEA molar ratio of between about 1/6.0 and 1/10.0, said fracturing fluid being stable at bottom hole static temperatures in excess of about 200 degrees F. at a pH in excess of 7.0. .

4,534,871

LUBRICANT INSERT FOR ROLLING BEARINGS

John H. Johnson, Wayne, Pa., assignor to SKF Industries, Inc., King of Prussia, Pa.

Continuation of Ser. No. 133,404, Mar. 24, 1980, abandoned. This application Apr. 21, 1982, Ser. No. 370,514
Int. Cl.³ C10M *5/00*
U.S. Cl. 252—12 **5 Claims**

1. A self supporting lubricant insert for a rolling bearing comprising inner and outer rings having confronting spaced raceways and a plurality of rolling elements in the annular space between the rings, said insert being composed of a firm, tough, solid gel matrix consisting of a polyolefin polymer containing a lubricating oil of lubricating viscosity which exudes therefrom to provide an oily surface in contact with the bearing elements which it engages, said lubricant insert adapted for easy assembly and removal from the bearing and comprising an annular member having a plurality of tabs contoured to the shape of the rolling elements and projecting axially from the inner face of the annular member to engage the rolling elements for effecting lubricant transfer and for detachably holding the insert in place in the bearing envelope, said axially projecting tabs are of a greater transverse dimension than the radial height between the land surfaces of the inner and outer rings and have outer contoured faces which merge with the annular ring member so that when the insert is seated, the contoured face engages the outer edge of the raceways to lock the insert in place.

4,534,872

MULTIFUNCTIONAL LUBRICANT ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 2, 1983, Ser. No. 519,444

The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.

Int. Cl.³ C10M *1/48, 1/46*

U.S. Cl. 252—32.7 E 22 Claims

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease or other solid lubricant prepared therefrom and a minor effective amount of a multifunctional additive consisting of a metal salt of a partially borated, partially phosphosulfurized hydroxyl-containing ester derived from polyols selected from pentaerythritol, dipentaerythritol, substituted pentaerythritol or mixtures thereof and trimethylolalkanes or mixtures of trimethylolalkanes.

4,534,873

AUTOMOTIVE FRICTION REDUCING COMPOSITION

Gary G. Clark, 107 E. F, South Hutchinson, Kans. 67505

Filed Sep. 28, 1983, Ser. No. 536,652

Int. Cl.³ C10M *1/10, 1/48*

U.S. Cl. 252—32.7 E 30 Claims

1. A friction reducing additive for direct addition to a lubricating oil crankcase, said additive comprising:

(a) a hydrocarbon oil of lubricating viscosity;

(b) an extreme pressure antiwear agent comprising a mixture of the following components:

(i) an oil dispersion of solid inorganic film-forming potassium borate;

(ii) antimony dialkylphosphorodithioate, and

(iii) a liquid chlorinated paraffin;

(c) an alkaline material in sufficient quantity for neutralizing acid components generated during use of said additive and having a total base number between about 10 and 400; and

(d) a viscosity index improving agent.

11. A method for reducing friction and wear in an oil lubricated internal combustion engine, comprising adding to the engine oil in the crankcase of said engine from about 3 to about 12% by volume of an additive having the following composition:

(a) a hydrocarbon oil of lubricating viscosity;

(b) an extreme pressure antiwear agent comprising a mixture of the following components:

(i) an oil dispersion of solid, inorganic film-forming potassium borate;

(ii) antimony dialkylphosphorodithioate, and

(iii) a liquid chlorinated paraffin;

(c) an alkaline material in sufficient quantity for neutralizing acid components generated during use of said additive and having a total base number between about 10 and 400; and

(d) a viscosity index improving agent.

20. A lubricating composition for internal combustion engines, said composition comprising from about 3 to about 12% by volume of the additive composition of claim 1 blended with a lubricating oil formulated for use as an automotive motor oil in compliance with standards set out by the Society of Automotive Engineers.

4,534,874

ANTI-OXIDATIVE, ANTI-THERMAL, AND ANTI-ACTINIC DEGRADATION AMIDES OF HYDROXYPHENYLALKYLTHIO ALKANOIC ACIDS, COMPOSITIONS, AND METHOD OF USE THEREFOR

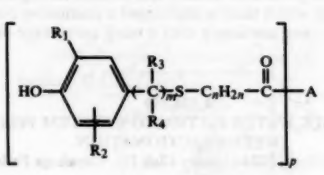
David H. Steinberg, New York; Raymond Seltzer, New City; John J. Luzzi, Carmel, and Frank P. Cortolano, Valhalla, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 21, 1983, Ser. No. 554,040

Int. Cl.³ C07D *251/04, 233/02, 295/04, 243/00*

U.S. Cl. 252—51.5 A 20 Claims

1. The compound of the formula I



(I)

wherein

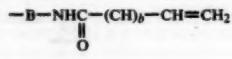
p and n are independently 1 to 4;

m is 1 or 2;

R_1 and R_2 are independently alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl, phenyl substituted by alkyl of 1 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 12 carbon atoms and R_2 additionally can be hydrogen;

R_3 and R_4 are independently hydrogen, alkyl of 1 to 12 carbon atoms or phenyl;

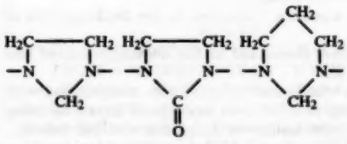
A when p=1 is a group —NHR_5, R_5 is hydrogen, alkyl of 1 to 18 carbon atoms or a group of the formula

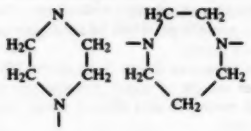


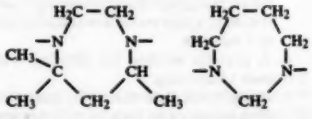
wherein

b is 0 to 2 and B is a direct bond or alkylene of 1 to 10 carbon atoms;

A when p=2 is a group of the formulae

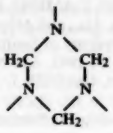




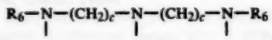


or is a group —NH—B—NH—, wherein B has the meaning given above;

A when p=3 is a group of the formula



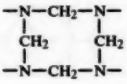
or of the formula



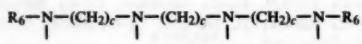
wherein

c is 2 to 6 and R_6 is alkyl of 1 to 4 carbon atoms; and

A when p=4 is a group of formula



or of formula



wherein c and R_6 have the meanings given above.

4,534,875

METHOD FOR HEAT EXCHANGE FLUIDS COMPRISING VISCOELASTIC SURFACTANT COMPOSITIONS

Gene D. Rose, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 13, 1984, Ser. No. 570,577

Int. Cl.[3] **C09K** *5/00*

U.S. Cl. 252—71 **19 Claims**

1. A method for improving heat exchange fluids wherein a heat exchange fluid is contacted with a funtionally effective amount of (1) a surfactant compound having a hydrophobic moiety chemically bonded to an ionic, hydrophilic moiety and (2) an electrolyte having a moiety that is capable of associating with the surfactant ion to form a viscoeleastic surfactant, and optionally (3) a further amount of an electrolyte having a moiety that is capable of associating with the surfactant ion, which further amount is sufficient to further reduce the friction experienced by the fluid; and which functionally effective amount is a sufficient amount to reduce the amount of friction experienced by the heat transfer fluid in the heat transfer apparatus.

4,534,876

METHOD FOR WASHING OF TEXTILES IN HARD WATER AND PHOSPHATE-FREE DETERGENT COMPOSITIONS FOR USE THEREIN

Gwendolen Browne, Rotterdam, Netherlands, assignor to De-Blauwe Lier B.V., Rotterdam-Metherlands, Netherlands

Filed May 10, 1983, Ser. No. 493,273

Int. Cl.[3] **C11D** *7/08, 7/12, 17/04*

U.S. Cl. 252—90 **7 Claims**

1. A method for washing textiles in hard water at a temperature of at most 70° C. with substantially complete exclusion of phosphates, wherein to the washing liquor are added substantially simultaneously:

(a) at least one inorganic salt derived from carbon dioxide inclusive hydrates, perhydrates and percarbonates thereof

(b) at least one acidic compound devoid of formation of a precipitate with the calcium and magnesium ions in the washing liquor at usual dosage

(c) at least one surface active compound devoid of formation of a precipitate with the calcium and magnesium ions in the washing liquor at usual dosage,

the ratio of these components being such that the pH of the resulting washing liquor is maintained throughout the complete washing cycle within the range of 5 to 8, and the components (a) and (b) being added physically separated.

4,534,877

SHAMPOO COMPOSITIONS COMPRISING SPECIFIC BETAINE SURFACTANTS AND A QUATERNARY COMPOUND

Glen D. Russell, Middletown, and Christian Steuri, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 403,907, Jul. 20, 1982, abandoned. This application Jun. 22, 1983, Ser. No. 506,921

Int. Cl.[3] **A61K** *7/08;* **C11D** *1/62, 1/90, 3/26*

U.S. Cl. 252—106 **14 Claims**

1. A shampoo composition having good freeze-thaw stability consisting essentially of:

(a) from about 0.5% to about 10% of a hair conditioning agent selected from the group consisting of quaternary ammonium compounds and quaternary amidazolinium compounds;

(b) from about 5% to about 25% of a higher alkylamido betaine, wherein the alkyl group is selected from the group consisting of lauryl, myristyl and mixtures thereof; and

(c) the remainder water.

4,534,878

ABRASIVE-CONTAINING CONTACT LENS CLEANING MATERIALS

Edward J. Ellis, Georgetown, and Joseph C. Salamone, Marblehead, both of Mass., assignors to Polymer Technology Corporation, Wilmington, Mass.

Continuation of Ser. No. 197,223, Oct. 15, 1980, Pat. No. 4,394,179, which is a continuation-in-part of Ser. No. 51,960, Jun. 25, 1979, abandoned. This application Jan. 6, 1983, Ser. No. 455,972

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.[3] **C11D** *3/04, 3/14, 3/37;* **G02C** *13/00*

U.S. Cl. 252—173 **5 Claims**

1. A hard contact lens cleaning material for cleaning plastic contact lenses and consisting essentially of a solution of a surface active agent with said agent being present in an amount of from about 0.1 to about 30% by weight,

an inorganic silica gel abrasive having an average particle size of no more than 20 microns of a particle size sufficient for use in lens polishing and in an amount of from 0.1 to under 25% by weight,

water as a suspending vehicle,

and separate means to maintain said surface active agent and abrasive in substantially uniform suspension so that said suspension is capable of cleaning a contact lens without adversely affecting or scratching said lens,

said separate means being selected from the class consisting of alkali metal halides, alkaline earth metal salts and hydrophilic polymers.

4,534,879

SYNTHETIC SURFACTANT FLAKES AND PROCESS FOR MAKING THEM

Stephen H. Iding, Cincinnati, and Robert H. Callicott, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 509,274, Jun. 29, 1983, abandoned. This application Jun. 27, 1984, Ser. No. 625,268
Int. Cl.[3] C11D *17/06*
U.S. Cl. 252—174 21 Claims

1. A process for making improved surfactant flakes from a water-wet paste which is dried on a heated roll drum dryer comprising the steps of:

A. Forming a 25° C. to 95° C. water-wet paste containing:

(a) From 20% to 30% of an alkali metal C_9–C_{15} alkyl sulfate;

(b) From 20% to 30% of an alkali metal C_9–C_{15} alkyl benzene sulfonate, wherein said (a) and (b) have a weight ratio of 1:1.5 to 1.5:1;

(c) From 0.5% to 10% of a water-soluble inorganic salt; and

(d) The balance water;

B. Forming heat dried flakes from said paste on said heated roll drum dryer, said flakes having a thickness of 0.1 mm to 1.3 mm and a moisture content of up to about 1.2%;

C. Cooling the flakes to about ambient temperature in a controlled environment having a dewpoint of less than about 10° C.;

wherein said improved surfactant flakes can carry a larger amount of perfume in a firm cake than a comparable cake made from flakes cooled above said dewpoint; and wherein said firm cake contains from 5% to 20% perfume.

4,534,880

DETERGENT COMPOSITION WITH SILICONATE-ZEOLITE AND SILICATE BUILDER

Jeffrey A. Kosal, and Edwin P. Plueddemann, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 27, 1984, Ser. No. 593,986
Int. Cl.[3] C11D *3/08, 3/12*
U.S. Cl. 252—174.13 18 Claims

1. A detergent composition comprising

(A) 5 to 40 percent by weight of an organic surfactant selected from the group consisting of anionic, nonionic and ampholytic surfactants;

(B) 1 to 50 percent by weight of an anionic siliconate-zeolite composite containing zeolite with a surface coating of 0.1 to 10 percent by weight of anionic functional siliconate represented by the formula

$$(MO)_aO_{(3-a)/2}Si—R—Y_b$$

wherein Y represents an alkali metal salt of an oxyacid group, R is an organic linking group wherein Y or other functionality selected from the group consisting of ether, sulfide, hydroxy, amide and amine is positioned at least 2 carbon atoms removed from the silicon atom, a has a value of from 1 to 3, b is an integer from 1 to 3, and M is an alkali metal cation or hydrogen; and

(C) 1 to 20 percent by weight of a water soluble alkali metal silicate.

4,534,881

INHIBITION OF INORGANIC OR BIOLOGICAL $CACO_3$ DEPOSITION BY POLY AMINO ACID DERIVATIVES

C. Steven Sikes, Mobile, Ala., and Alfred P. Wheeler, Clemson, S.C., assignors to University of South Alabama, Mobile, Ala.

Filed Dec. 19, 1983, Ser. No. 563,144
Int. Cl.[3] C02F *5/10*
U.S. Cl. 252—180 15 Claims

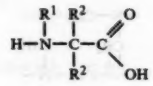
1. A method of inhibiting the formation of $CaCO_3$-containing deposits on a surface, comprising:

applying to said surface an anticalcifying composition comprising an amino acid polymer of at least 400 MW of the formula:

$$poly(X_nY_m)$$

wherein

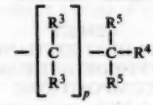
(1) each X, independently, is the residue of an amino acid of the formula:



wherein

(a) each R^1, independently, is H, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_4 haloalkyl, C_2–C_4 haloalkenyl, C_2–C_4 haloalkynyl, halogen, C_1–C_4 alkoxy or C_1–C_4 haloalkoxy; and

(b) R^2 is a radical of the formula:



wherein

(i) each R^3, independently, is H, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_4 haloalkyl, C_2–C_4 haloalkenyl, C_2–C_4 haloalkynyl, halogen, OH, C_1–C_4 alkoxy or C_1–C_4 alkylamino;

(ii) each R^4, independently, is COOH, $CONH_2$, COR^6, $COOR^6$, COOM, SO_4H, SO_3NH_2, SO_3R^6, SO_4R^6, SO_4M, PO_4H_2, PO_3HNH_2, PO_3HOR^6, or $PO_2(OR^6)_2$ wherein R^6 is C_1–C_4 alkyl, C_2–C_4 alkenyl, C_2–C_4 alkynyl, C_1–C_4 haloalkyl, C_2–C_4 haloalkenyl, or C_2–C_4 haloalkynyl, and M is Na, K, ½ Ca or ½ Ba;

(iii) each R^5, independently, is R^4, R^6, H, or OH, and

(iv) each p, independently, is 0–4;

(2) each Y, independently, is X wherein R^1 has the meanings previously defined and R^2 has both the meanings previously defined and further is H, R^6, OH, C_1–C_4 alkylamino, C_1–C_4 hydroxyalkyl, phenyl C_1–C_4 alkyl, hydroxyphenyl C_1–C_4 alkyl, or phenyl; and

(3) m/n is a number from 1 to 10; in an amount effective for inhibiting the formation of $CaCO_3$-containing deposits.

4,534,882

METHOD OF MAKING AN EPOXY PREPOLYMER CURING AGENT

Norman Bilow, Encino, and Ralph D. Hermansen, Northridge, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 4, 1984, Ser. No. 646,885
Int. Cl.[3] C08G *59/50*
U.S. Cl. 252—182 11 Claims

1. A method of making an epoxy prepolymer curing agent composition comprising the steps of:

(a) reacting a mixture of piperidine and an epoxy resin so as to form an epoxy prepolymer; and

(b) adding 2-ethyl-4-methylimidazole to said epoxy prepolymer thereby forming said curing agent composition.

4,534,883

4-UNSUBSTITUTED OR SUBSTITUTED-4 CYANOTERCYCLOHEXANE DERIVATIVES

Shigeru Sugimori, Fujisawashi; Tetsuhiko Kojima, Yokohamashi; Toyoshiro Isoyama, Yokohamashi, and Kazunori Nigorikawa, Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

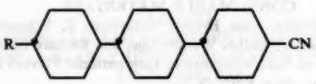
Filed Feb. 29, 1984, Ser. No. 584,768

Claims priority, application Japan, Mar. 2, 1983, 58-34225

Int. Cl.³ C09K *3/34*; G02F *1/13*; C07C *121/46*

U.S. Cl. 252—299.63 **6 Claims**

1. 4-unsubstituted or substituted-4''-cyano-trans,trans,trans-tercyclohexanes having the general formula



(I)

wherein R represents hydrogen atom or an alkyl group of 1 to 10 carbon atoms.

4,534,884

PROCESS FOR THE PREPARATION OF PHOSPHOR

Satoshi Arakawa; Takashi Nakamura, and Kenji Takahashi, all of Kaisei, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Nov. 7, 1983, Ser. No. 549,414

Claims priority, application Japan, Nov. 8, 1982, 57-194696

Int. Cl.³ C09K *11/465*

U.S. Cl. 252—301.4 H **3 Claims**

1. A process for the preparation of a divalent europium activated alkaline earth metal fluorohalide phosphor enhanced in emission luminance comprising firing a mixture of starting materials for the phosphor under a reducing atmosphere at 600° to 1,000° C., characterized in that said mixture of starting materials for the phosphor is impregnated with a liquid organic compound thermally decomposable to produce both or either of carbon and carbon monoxide, and said reducing atmosphere is formed or reinforced by both or either of carbon and carbon monoxide produced by the thermal decomposition of the liquid organic compound in the firing stage.

4,534,885

PHOSPHATE FLUORESCENT SUBSTANCE

Shusaku Kakita, and Thihiro Yoshida, both of Odawara, Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Jun. 27, 1984, Ser. No. 625,298

Claims priority, application Japan, Jun. 30, 1983, 58-118996

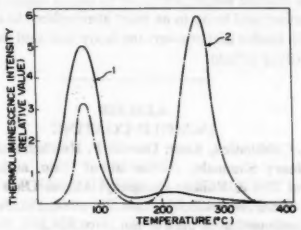
Int. Cl.³ C09K *11/08*

U.S. Cl. 252—301.4 P **11 Claims**

1. A phosphate fluorescent substance having high brightness and a high brightness maintenance ratio which comprises:

(a) a parent material of an orthophosphate of zinc or a mixture of an orthophosphate of zinc and one or more orthophosphates of a divalent metal selected from the group consisting of magnesium, calcium, strontium, barium and beryllium; and

(b) a main activator comprising manganese; wherein said phosphate fluorescent substance has a maximum intensity point in the glow curve for the range of 25° C.–400° C. in the range of 200° C.–400° C., or the ratio of Ia/Ib is within the range of 0.6–3.0, wherein Ia and Ib denote the maximum intensity of emission of the phosphate fluorescent substance when said substance is excited by an excitation energy having wavelengths of 200–280 nm and 380–420 nm, respectively; or said substance has a combination of the above.



4,534,886

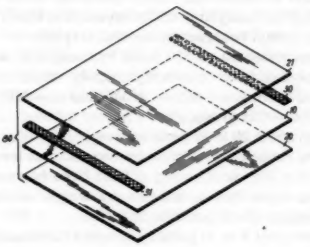
NON-WOVEN HEATING ELEMENT

Robert G. Kraus, Attleboro, Mass., and James R. Quick, Warwick, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Jan. 15, 1981, Ser. No. 225,291

Int. Cl.³ H01B *1/02*

U.S. Cl. 252—502 **13 Claims**



1. An electrically conductive non-woven web for a heating element comprising, in combination, conductive fibers having melting points no lower than about 400° F., electrical resistances no greater than about 25,000 ohm/cm, and lengths in the range of from about ¼ inch to about two inches, and conductive particles, the conductive particles comprising from about 5% to about 50% of the final dry weight of the web.

4,534,887

MOLDED-TO-SIZE SILVER-GRAPHITE ARTICLES AND PROCESS FOR MAKING SAME

Floyd J. Broady, Taylors, and J. Rondal Jasek, Greenville, both of S.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 22, 1983, Ser. No. 516,233

Int. Cl.³ H01B *1/04*

U.S. Cl. 252—503 **9 Claims**

1. A process for producing a molded graphite-silver article containing silver particles uniformly distributed throughout said article comprising the steps of:

(a) mixing graphite particles with a silver containing compound selected from the group consisting of silver nitrate, silver acetate, silver carbonate and silver protein complexes;

(b) heating said mixture to reduce said silver compound to metallic silver;

(c) milling the resulting product and mixing it with a pitch binder and a solvent to produce a slurry;

(d) removing volatiles from said slurry and milling the residue;
(e) molding the residue of step (d) to produce a dense body of a desired shape; and
(f) heating said body in an inert atmosphere to carbonize the pitch binder and convert the body into said molded graphite-silver article.

4,534,888

IN-MOLD COATING

David S. Cobbledick, Kent; Donald F. Reichenbach, Massillon, and Henry Shanoski, Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 435,026, Oct. 25, 1982, Pat. No. 4,414,173, and a continuation-in-part of Ser. No. 316,592, Nov. 2, 1981, abandoned. This application Jul. 18, 1983, Ser. No. 514,415
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—511 **9 Claims**

1. A composition useful as a thermosetting coating composition comprising
(a) 100 parts by weight of at least one polymerizable epoxy based oligomer having at least two acrylate groups and a weight average molecular weight of from about 500 to 1,500,
(b) from about 80 to 160 parts by weight of at least one copolymerizable ethylenically unsaturated monomer selected from the group consisting of styrene, alpha methyl styrene, vinyl toluene, t-butyl styrene, chlorostyrene, methyl methacrylate, diallyl phthalate (with styrene or methyl methacrylate), triallyl cyanurate, triallyl isocyanurate, divinyl benzene and methyl acrylate,
(c) from about 10 to 120 parts by weight of at least one copolymerizable monoethylenically unsaturated compound having a —CO— group and a $—NH_2$, —NH— and/or —OH group,
(d) from about 20 to 90 parts by weight of polyvinyl acetate,
(e) from about 0.2 to 5 parts by weight of at least one zinc salt of a fatty acid having at least 10 carbon atoms,
(f) from about 0.01 to 1.0 part by weight of at least one accelerator for a peroxide initiator,
(g) from about 5 to 30 parts by weight of conductive carbon black,
(h) from about 50 to 155 parts by weight of a filler and
(i) from about 5 to 120 parts by weight of a copolymerizable or cocurable diacrylate compound having a weight average molecular weight of from about 250 to 5,000 and being selected from the group consisting of
(I) at least one polyoxyalkylene glycol oligomer having two acrylate groups and
(II) at least one polyurethane based oligomer having two acrylate groups and mixtures of (I) and (II).

4,534,889

PTC COMPOSITIONS AND DEVICES COMPRISING THEM

Peter H. van Konynenburg, Mountain View; Bernard J. Lyons, Atherton; Robert Smith-Johannsen, Portola Valley, and Wendell W. Moyer, Atherton, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 329,589, Dec. 10, 1981, abandoned, which is a continuation of Ser. No. 969,928, Dec. 15, 1978, abandoned, which is a continuation of Ser. No. 900,907, Apr. 28, 1978, abandoned, which is a continuation of Ser. No. 732,792, Oct. 15, 1976, abandoned. This application Feb. 22, 1983, Ser. No. 468,768
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—511 **43 Claims**

1. A process for the preparation of a PTC composition which comprises
(1) dispersing conductive particles having a size of at least 18 millimicrons in a polymer;
(2) cross-linking the dispersion from step (1) at a first temperature (T_{c1}) and
(3) further cross-linking the cross-linked composition from step (2) at a second temperature (T_{c2}) which is substantially different from T_{c1}
the composition obtained in step (3) having a gel fraction of at least 0.6; exhibiting PTC behavior with an R_{14} value of at least 2.5 or a R_{100} value of at least 10 and at least one T_s within the temperature range of −100 to 250° C.; and having a volume resistivity at temperatures below T_s of 25 to 10^5 ohm-cm.

4,534,890

USES OF PARA-ACYLOXYCYCLOHEXYL ALKYLCARBOXYLATES IN AUGMENTING OR ENHANCING THE ORGANOLEPTIC PROPERTIES OF CONSUMABLE MATERIALS

Mark A. Sprecker, Sea Bright; Wilhelmus J. Wiegers, Red Bank; Robert P. Belko, Woodbridge, and Richard M. Boden, Ocean, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 12, 1984, Ser. No. 570,202
Int. Cl.³ C11B *9/00*
U.S. Cl. 252—522 R **8 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes, and perfumed articles, comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of at least one para-acyloxycyclohexyl alkylcarboxylate defined according to the structure:

wherein R_1 represents hydrogen or C_2–C_4 acyl and R_2 represents C_1–C_3 alkyl.

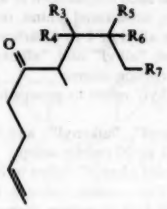
4,534,891

BRANCHED C_{13}-ALK-1-EN-5-ONES AND USE THEREOF IN PERFUMERY

Richard M. Boden, Ocean; Steven D. Temes, Hazlet; Theodore J. Tyszkiewicz, Sayreville, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 441,375, Nov. 12, 1982, Pat. No. 4,465,863. This application Jan. 26, 1984, Ser. No. 574,155
Int. Cl.³ C11B *9/00*
U.S. Cl. 252—522 R **5 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, perfumed articles and colognes comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of at least one ketone defined according to the structure:



wherein R_3, R_4, R_5, R_6 and R_7 represent hydrogen or methyl with the provisos that:

(i) the sum total of the carbon atoms in R_3, R_4, R_5, R_6 and R_7 is three;

(ii) when R_7 is methyl then R_5 and R_6 are both methyl; and

(iii) when either R_3 or R_4 is methyl then R_7 is hydrogen.

4,534,892

FOAMING LIQUID DETERGENT COMPOSITION HAVING A STABLY DISPERSED WATER-INSOLUBLE FINE POWDER

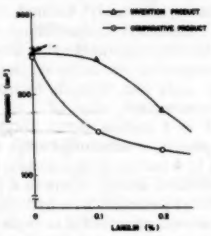
Toshio Suzuki, Ichikawa; Hiroshi Watanabe, Funabashi, and Rikio Tsushima, Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,654

Claims priority, application Japan, Jul. 27, 1982, 57-130730

Int. Cl.³ C11D *3/14, 3/50*

U.S. Cl. 252—545 **16 Claims**



1. A liquid detergent comprising:

(a) an anionic surface active agent;

(b) a water-insoluble fine powder selected from the group consisting of silicon dioxide, aluminium oxide, mangesium oxide, titanium oxide, aluminosilicate, silicon carbide, calcium carbonate, calcium phosphate, chromium oxide, barium carbonate, Hansa Yellow, talc, mica, fish scale, zinc-2-pyridyl-thio-1,1'-dioxide, corundum, emery, silica, quartz sand, doromite, sand, shell, and mixtures thereof;

(c) a cross-linking amphoteric polymer selected from the group consisting of (1) a copolymerization product obtained by polymerizing acidic vinyl and basic vinyl monomers in the presence of a cross-linking monomer, and (2) a polymerization product obtained by polymerizing an amphoteric monomer in the presence of a cross-linking monomer; and,

(d) an inorganic salt selected from the group consisting of potassium sulfate, sodium sulfate, mangesium sulfate, aluminium sulfate, potassium nitrate, sodium nitrate, magnesium nitrate, calcium nitrate, aluminium nitrate, potassium chloride, sodium chloride, magnesium chloride, calcium chloride, aluminium chloride, potassium carbonate, sodium carbonate, aluminium carbonate, and mixtures thereof;

said liquid detergent being further characterized in that it comprises the anionic surface active agent in a weight percent range of from 5 to 30, the water-insoluble fine powder in a weight percent range of from 0.1 to 15, the cross-linking type amphoteric polymer in a weight percent range of from 0.1 to 5, and the inorganic salt in a weight percent range of from 1 to 10.

4,534,893

METHOD FOR SOLIDIFYING RADIOACTIVE WASTES

Theodor Dippel, Eggenstein-Leop., and Andreas Loida, Stutensee, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 432,407

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1982, 3214242

Int. Cl.³ G21F *9/16*

U.S. Cl. 252—629 **10 Claims**

1. Process of solidifying radioactive substances by producing compact blocks disposed in transporting or permanent storage containers, the compact blocks being produced from prefabricated ceramic tablets which contain radioactive substances and an inactive matrix which continuously surrounds the tablets and is solid in its final state, comprising

(a) providing as the matrix material at least one material selected from glass powder and a mixture of oxidic non-clay minerals, the glass powder being a powder of an alkali borosilicate glass having a transformation range between 840° K. and 1370° K., and a particle size distribution of 50% by weight <10 microns and 50% by weight $\geqq 10$ microns, and 99% by weight being at <63 microns, the glass powder having a composition of more than 70% by weight SiO_2, a maximum amount of 10% by weight B_2O_3, a maximum amount of 10% by weight Al_2O_3, and a maximum amount of 10% by weight Na_2O and the mixture of oxidic non-clay minerals comprising a mixture of 50 to 70% by weight SiO_2, 15 to 35% by weight Al_2O_3 and 10 to 35% by weight MgO;

(b) filling the ceramic tablets and the matrix material into a container, and compressing the ceramic tablets and matrix material by vibration to form a compressed mixture in the container;

(c) heating the thus obtained compressed mixture to a temperature in the range of 1423° to 1623° K., holding the compressed mixture at that temperature range for one to three hours, and finally gradually cooling to room temperature.

4,534,894

PROCESS FOR SULPHATION AND PHOSPHORYLATION OF PROTEINS AND PEPTIDES

Anthony Cerami, Flanders, N.J.; Sandor Pongor, and Michael Brownlee, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Nov. 17, 1982, Ser. No. 442,492

Int. Cl.³ A61K *37/26*; C07C *103/52*; C07G *7/00*

U.S. Cl. 260—112.7 **7 Claims**

1. A method of preparing a sulphated protein or a peptide comprising contacting a protein or peptide having a hydroxyl group with sulphuric acid in the presence of a non-aqueous apolar organic solvent and contacting the resulting solution with a dehydrating agent.

4,534,895

1-AZIDOMETHYL-3,5,7-TRINITRO-1,3,5,7-TETRAZACYCLOOCTANE AND SYNTHESIS THEREOF VIA AZIDATION WITH ACETYL AZIDE

Milton B. Frankel, Tarzana, and Dean O. Woolery, II, Reseda, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 22, 1983, Ser. No. 534,992
Int. Cl.³ C07D 257/02
U.S. Cl. 260—239 BC **9 Claims**

1. A method of preparing 1-azidomethyl-3,5,7-trinitro-1,3,5,7-tetrazacyclooctane, which comprises the steps of:

combining the reactants 1-bromomethyl-3,5,7-trinitro-1,3,5,7-tetrazacyclooctane with acetyl azide in an inert organic solvent; and

reacting said reactants under non-basic conditions while maintaining the reaction temperature below about 40° C.

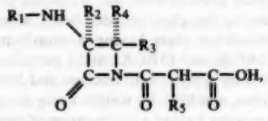
4,534,896

3-ACYLAMINO-2-OXOAZETIDINE-1-(β-OXOPROPIONIC ACID)

Uwe D. Treuner, Regensburg, and Hermann Breuer, Schoenhofen, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 13, 1983, Ser. No. 503,964
Int. Cl.³ C07D 205/08; A61K 31/395, 403/12, 401/12
U.S. Cl. 260—239 A **12 Claims**

1. A compound having the formula

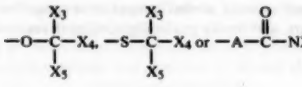


or a pharmaceutically acceptable basic salt or hydrolyzable ester thereof, wherein

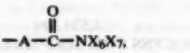
R_1 is an acyl group derived from a carboxylic acid;

R_2 is hydrogen or methoxy;

R_3 and R_4 are the same or different and each is hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, phenyl, substituted phenyl or a 4,5,6 or 7-membered heterocycle or one of R_3 and R_4 is hydrogen and the other is azido, halomethyl, dihalomethyl, trihalomethyl, alkoxycarbonyl, alkenyl, alkynyl, 2-phenylethenyl, 2-phenylethynyl, carboxyl, $—CH_2X_1$, $—S—X_2$, $—O—X_2$,



wherein X_1 is azido, amino, hydroxy, alkanoylamino. alkylsulfonyloxy, phenylsulfonyloxy, (substituted phenyl)sulfonyloxy, phenyl, substituted phenyl, cyano,



$—S—X_2$ or $—O—X_2$; X_2 is alkyl, substituted alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, alkanoyl, phenylalkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, or heteroarylcarbonyl; one of X_3 and X_4 is hydrogen and the other is hydrogen or alkyl, or X_3 and X_4 when taken together with the carbon atom to which they are attached form a cycloalkyl group; X_5 is formyl, alkanoyl, phenylcarbonyl, (substituted phenyl)carbonyl, phenylalkylcarbonyl, (substituted phenyl)alkylcarbonyl, carboxyl, alkoxycarbonyl, aminocarbonyl, (substituted amino)carbonyl, or cyano; A is $—CH=CH—$, $—(CH_2)_n—$, $—CH_2—O—$, $—CH_2—NH—$ or $—CH_2—S—CH_2—$; n is 0, 1 or 2; and X_6 and X_7 are the same or different and each is hydrogen or alkyl, or X_6 is hydrogen and X_7 is amino, substituted amino, or alkoxy); and

R_5 is hydrogen or alkyl of 1 to 4 carbon atoms;

wherein the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;

the terms "alkanoyl", "alkenyl", and "alkynyl" refer to groups having 2 to 10 carbon atoms;

the term "substituted phenyl" refers to a phenyl group substituted with 1, 2 or 3 amino, halogen, hydroxyl, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or carboxyl groups;

the term "substituted alkyl" refers to alkyl groups substituted with one or more azido, amino, halogen, hydroxy, carboxy, cyano, alkoxycarbonyl, aminocarbonyl, alkanoyloxy, alkoxy, phenyloxy, (substituted phenyl)oxy, (4, 5, 6 or 7-membered heterocycle)oxy, mercapto, alkylthio, phenylthio, (substituted phenyl)thio, alkylsulfinyl or alkylsulfonyl groups;

the term "heteroaryl" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl or one of the above groups substituted with one or more halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups;

the term "a 4, 5, 6 or 7-membered heterocycle" refers to pyridinyl, furanyl, pyrrolyl, thienyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, thiazolyl, thiadiazolyl, pyrimidinyl, oxazolyl, triazinyl, tetrazolyl, azetinyl, oxetanyl, thietanyl, piperidinyl, piperazinyl, imidazolidinyl, oxazolidinyl, pyrrolidinyl, tetrahydropyrimidinyl, dihydrothiazolyl or hexahydroazepinyl or one of the above groups substituted with one or more oxo, halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylsulfonyl, phenyl, substituted phenyl, or substituted alkyl, wherein the alkyl group has 1 to 4 carbon atoms, groups; and

the term "substituted amino" refers to a group having the formula $—NY_1Y_2$ wherein Y_1 is hydrogen, alkyl, phenyl, substituted phenyl, phenylalkyl or (substituted phenyl)alkyl, and Y_2 is alkyl, phenyl, substituted phenyl, phenylalkyl, (substituted phenyl)alkyl, hydroxy, cyano, alkoxy, phenylalkoxy or amino.

4,534,897

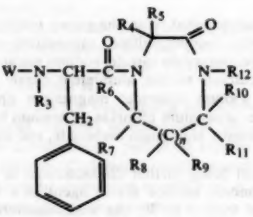
PIPERAZINONE, PIPERAZINE, 1,4-DIAZEPIN-2-ONE AND 1,4-DIAZEPINE INTERMEDIATE COMPOUNDS

Malcolm W. Moon, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 153,435, May 27, 1980,. This application Apr. 10, 1984, Ser. No. 598,608
Int. Cl.³ C07D 210/00
U.S. Cl. 260—239.3 R **36 Claims**

1. A compound selected from the group consisting of compounds of the formula

(IX)



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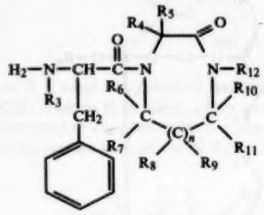
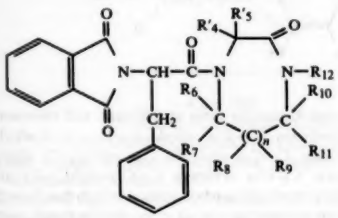
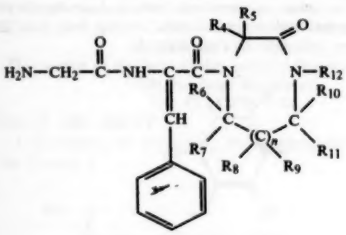


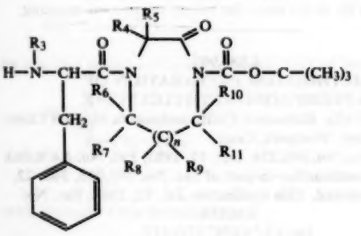
(X)



(XXIII)



(XXXVII)



(XLIV)

and salts thereof where

R_3 is a hydrogen atom or methyl group;

R_4 is a hydrogen atom, alkyl of 1 thru 6 carbon atoms, cycloalkyl substituted alkyl of 4 thru 7 carbon atoms total, hydroxyalkyl where the alkyl portion is 1 thru 4 carbon atoms, R_{4a}—S—R_{4b}— or amino substituted alkyl where the alkyl portion is 2 thru 5 carbon atoms;

R_{4a} is alkyl of 1 thru 3 carbon atoms;

R_{4b} is alkyl of 1 thru 3 carbon atoms;

R_4' is alkyl of 1 thru 6 carbon atoms, cycloalkyl substituted alkyl of 4 thru 7 carbon atoms total, hydroxyalkyl where the alkyl portion is 1 thru 4 carbon atoms, R_{4a}—S—R_{4b}— or amino substituted alkyl where the alkyl portion is 2 thru 5 carbon atoms;

R_5, R_6, R_7, R_8, R_9, R_{10}, R_{11}, R_{12} are when present independently a hydrogen atom, alkyl of 1 thru 4 carbon atoms, cycloalkyl of 3 thru 5 carbon atoms, cycloalkyl substituted alkyl of 4 thru 7 carbon atoms total with the proviso that the total number of carbon atoms in all these groups together when present is 0 thru 10;

R_5' is alkyl of 1 thru 4 carbon atoms, cycloalkyl of 3 thru 5 carbon atoms, cycloalkyl substituted alkyl of 4 thru 7 carbon atoms total with the proviso that the total number of carbon atoms of R_5' and R_6–R_{12} together when present is 1 thru 10;

n is 0 or 1; and

W is an amino blocking group selected from the group consisting of benzyloxycarbonyl or t-butoxycarbonyl.

4,534,898

1-OXA-1-DETHIA-CEPHALOSPORIN DERIVATIVES

Seiji Shibahara, Machida; Tsuneo Okonogi, Yokohama; Yasushi Murai, Yokosuka; Shunzo Fukatsu, Tokyo; Tadashi Wakazawa; Taro Niida, both of Yokohama, all of Japan, and Burton G. Christensen, Cliffside, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

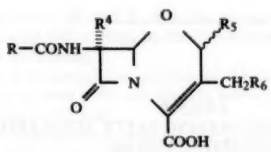
Filed Jul. 20, 1983, Ser. No. 515,422

Claims priority, application Japan, Jul. 23, 1982, 57-127574; Sep. 16, 1982, 57-159548

Int. Cl.³ C07D *419/14*

U.S. Cl. 260—245.3 **4 Claims**

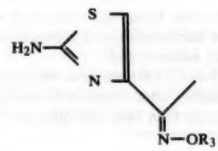
1. A compound of the formula:



(I)

and a pharmaceutically acceptable salt or ester thereof, wherein R represents a group of the formula:

in which R_1 is a 2-thienyl or 3-thienyl group, and R_2 is a hydrogen atom or a carboxyl group, or R-represents a group of the formula:



in which R_3 is a hydrogen atom, a lower alkyl or carboxyl-lower alkyl group; R_4 represents a hydrogen atom or a methoxy group, R_5 represents a lower alkyl group; R_6 represents hydrogen, azido, halo, cyano, hydroxy, carbamoyloxy, N-loweralkyl carbamoyloxy, N,N-diloweralkyl carbamoyloxy, amino, mercapto, loweralkylthio, loweralkanoyloxy, benzoyloxy, or a 5- or 6-membered optionally substituted heterocyclic thio radical selected from the group consisting of tetrazol-5-ylthio; 1-methyltetrazol-5-ylthio; 1-carboxymethyltetrazol-5-ylthio; 1-sulfomethyltetrazol-5-ylthio; N,N-dimethylaminoethyltetrazol-5-ylthio; 1,3,4-thiadiazol-5-ylthio; 2-methyl-1,3,4-thiadiazol-5-ylthio; 2-carboxymethyl-3-methylthiazol-5-ylthio; 1,2,3-triazol-5-ylthio; 4-carboxy-3-hydroxy-1,2-oxazol-5-ylthio; 6-hydroxy-2-methyl-1,2,4-triazin-5-on-3-ylthio.

4,534,899

SYNTHETIC PHOSPHOLIPID COMPOUNDS

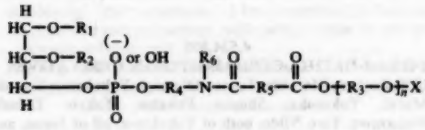
Barry D. Sears, Marblehead, Mass., assignor to Lipid Specialties, Inc., Danvers, Mass.

Continuation-in-part of Ser. No. 284,675, Jul. 20, 1981, Pat. No. 4,426,330. This application Mar. 7, 1983, Ser. No. 472,481

Int. Cl.³ C07F 9/10

U.S. Cl. 260—403 **18 Claims**

1. A synthetic phospholipid compound having the structural formula:



wherein R_1 and R_2 represent hydrogen or organic acyl radicals; R_3 represents a C_2 to C_4 alkylene radical; X represents hydrogen or an alkyl radical; R_4 represents a C_2 to C_{10} alkylene radical; R_5 represents an organic linking radical; R_6 represents hydrogen or a lower alkyl radical; and n represents a number of from 0 to 200.

4,534,900

PROCESS FOR SEPARATING FATTY ACIDS FROM UNSAPONIFIABLES

Michael T. Cleary, Elmhurst, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 598,121, Apr. 9, 1984. This application Nov. 13, 1984, Ser. No. 670,193

Int. Cl.³ C09F 5/10; C11B 3/00

U.S. Cl. 260—428.5 **6 Claims**

1. A process for separating a fatty acid from a feed mixture comprising said fatty acid and an unsaponifiable compound, said process comprising:

(a) introducing said feed mixture into an extraction zone, and therein contacting said mixture with a solvent comprising an alcohol and water solution which is selective for absorbing said fatty acid;

(b) removing a raffinate stream from said extraction zone which contains a higher concentration of unsaponifiable compound than said feed mixture; and

(c) removing a solvent-rich extract stream from said extraction zone containing a higher concentration of said fatty acid, on a solvent free basis, than said feed mixture.

4,534,901

COBALT-BORON COMPOUNDS

Rüdiger Schubart, and Hans Magg, both of Bergisch-Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

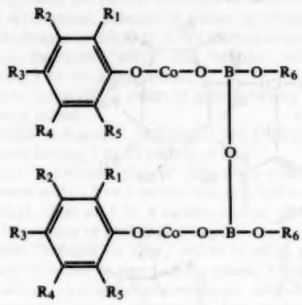
Filed Aug. 17, 1983, Ser. No. 523,968

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1982, 3231913

Int. Cl.³ C07F 15/06

U.S. Cl. 556—7 **2 Claims**

1. Compounds corresponding to the formula

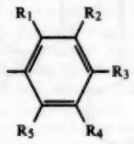


(I)

wherein

R_1, R_2, R_3, R_4 and R_5 are the same or different, and represent hydrogen, hydroxy, C_1–C_{18} alkyl, C_5–C_{12} cycloalkyl, C_1–C_{16} alkylthio, C_6–C_{14} aryl, C_6–C_{14} aryl-C_1–C_4 alkyl, C_1–C_{18} alkoxy, C_6–C_{14} aryloxy, C_6–C_{14}-aryl-C_1–C_4 alkyloxy, halogen or a hydrocarbon radical which has from 2 to 18 carbon atoms and has one or more double bonds, and

R_6 represents a linear or branched, saturated or mono- or poly-unsaturated hydrocarbon radical having from 1 to 22 carbon atoms or a radical of the formula



wherein R_1 to R_5 have the before-mentioned meaning.

4,534,902

METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

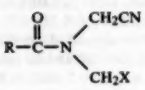
Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 540,254, Oct. 11, 1983, Pat. No. 4,476,063, which is a continuation-in-part of Ser. No. 391,033, Jun. 22, 1982, abandoned. This application Jul. 12, 1984, Ser. No. 630,156

Int. Cl.³ C07C 121/417

U.S. Cl. 260—465.4 **3 Claims**

1. A compound of the formula



wherein R is C_1–C_4 alkyl or ethoxy and X is chlorine, bromine or iodine.

4,534,903

PROCESS FOR THE PREPARATION OF SUBSTITUTED AMINO DIENES

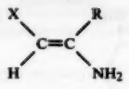
Guy R. Collins, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 25, 1983, Ser. No. 469,547

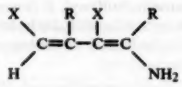
Int. Cl.³ C07C 120/00, 101/20

U.S. Cl. 260—465.5 R **20 Claims**

1. A process comprising contacting an aminoalkene of the formula:



wherein R is alkyl or cycloalkyl, and wherein X is —CN or —$COOR_1$ wherein R_1 is alkyl; with a strong non-mineral acid in the presence of a solvent under reaction conditions such that there is formed an aminodiene of the formula:



4,534,904

PROCESS FOR PRODUCING N-PHOSPHONOMETHYLGLYCINE

Hans Moser, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

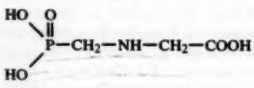
Division of Ser. No. 442,933, Nov. 19, 1982, Pat. No. 4,486,358, which is a continuation-in-part of Ser. No. 391,816, Jun. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 327,138, Dec. 3, 1981, Pat. No. 4,369,142. This application Jul. 13, 1984, Ser. No. 630,626

The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.[3] **C07F** *9/38*

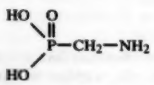
U.S. Cl. 260—502.5 F **3 Claims**

1. A process for producing N-phosphonomethylglycine of the formula I



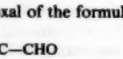
(I)

by reacting aminomethanephosphonic acid of the formula II



(II)

with glyoxal of the formula III



(III)

in an aqueous medium and in the presence of sulfur dioxide, said glyoxal being added to a suspension of said aminomethanephosphonic acid and an alkali metal hydrogen sulfite as a source of sulfur dioxide, and isolating the resulting product.

4,534,905

PROCESS FOR THE PREPARATION OF NITRONAPHTHALENE-SULPHONIC ACIDS

Horst Behre, Odenthal-Eikamp; Heinz U. Blank, Odenthal; Gerhard Burmeister, Leverkusen, and Otto Lindner, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

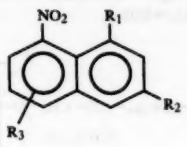
Filed May 20, 1981, Ser. No. 265,271

Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020441

Int. Cl.[3] **C07C** *143/24*

U.S. Cl. 260—505 C **9 Claims**

1. In the process for the preparation of α-nitronaphthalene-sulphonic acids of the formula



in which

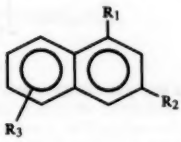
R_3 is in the 5-position or 6-position,

R_1 and R_3 independently of one another are a SO_3H group or NO_2 group and

R_2 is a hydrogen atom or a SO_3H group or

NO_2 group, with the proviso that at least one of the substituents R_1, R_2 or R_3 is a SO_3H group,

by reacting the corresponding naphthalene-sulphonic acids of the formula



in which R_1, R_2 and R_3 have the above stated meaning with nitric acid and working up the nitration mixture, the improvement comprising

(a) interrupting the reaction of the naphthalene-sulphonic acids with nitric acid already before the nitration reaction has ended and

(b) treating the nitration mixture, if appropriate after dilution with water, with bases at a pH value of 5 to 14.

4,534,906

REMOVAL OF IMPURITIES FROM HUMAN LEUKOCYTE INTERFERON PREPARATIONS

Paul D. Johnston, San Mateo, Calif., assignor to Genentech, Inc., San Francisco, Calif.

Filed Nov. 1, 1982, Ser. No. 438,129

Int. Cl.[3] **A61K** *45/02;* **C07G** *7/00*

U.S. Cl. 260—112 R **15 Claims**

1. A method of removing oligomers and slow monomer from leukocyte interferon (IFN-α) having high sequence homology with human leukocyte interferon which method comprises:

(a) incubating a buffer solution containing 1–20 mg/ml of IFN-α at a pH between 3 and approximately 4.8 for 30 minutes–24 hours at 28°–40° C. to precipitate oligomers and slow monomer followed by;

(b) recovering native IFN-α.

4,534,907

ALKOXYLATED POLYESTER POLYOLS

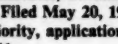
Dwight E. Peerman, and Edgar R. Rogier, both of Minnetonka, Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Sep. 7, 1982, Ser. No. 415,522

Int. Cl.[3] **C09F** *5/08*

U.S. Cl. 260—410.6 **28 Claims**

1. Alkoxylated polyester polyols formed by reacting at least one non-gelled polyester polyol of the formula:



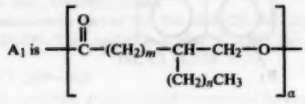
where

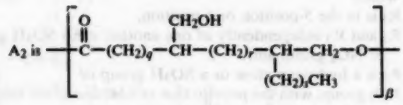
R is a polyol residue;

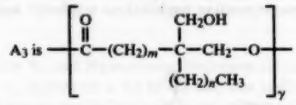
p is an integer from 2 to 6; and,

A may be the same or different and is selected from the

group consisting of A_1, A_2 and A_3 and combinations of A_1, A_2 and A_3, where







where

m, n, q, r, α, β and γ are integers and where

$m>3$

$n \geqq 0$ and

$m+n$ is from 11 to 19

$q>3$

$r \geqq 0$

$s \geqq 0$ and

$q+r+s$ is from 10 to 18

α is from 0 to 10

β is from 0 to 10 and

γ is from 1 to 10, except that all α's, β's and γ's in any given compound are not all zero;

with at least one alkylene oxide in a ratio of moles of alkylene oxide per equivalents of hydroxyl in the polyester polyol from about 0.5:1 to 5:1.

4,534,908

WATER-SOLUBLE DISAZO COMPOUNDS AND NEW BIS-(AMINOPHENOXY)-ETHANE COMPOUNDS HAVING FIBER-REACTIVE GROUPS AS THE TETRAZO COMPONENTS, AND USE OF THE DISAZO COMPOUNDS AS DYESTUFFS

Hermann Fuchs, Königstein, and Klaus Filzinger, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

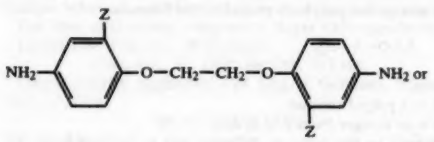
Division of Ser. No. 401,408, Jul. 23, 1982,. This application Sep. 26, 1983, Ser. No. 535,431

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1981, 3129401

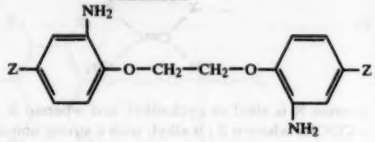
Int. Cl.[3] **C07C** *141/16, 93/14*

U.S. Cl. 260—458 C **3 Claims**

1. A diamino compound of the formula



-continued



in which both Z substituents are identical and each is β-hydroxyethylsulfonyl, β-chloroethylsulfonyl, β-sulfatoethylsulfonyl, β-phosphatoethylsulfonyl, β-(lower alkylsulfonyloxy)-ethylsulfonyl, β-(arylsulfonyloxy)-ethylsulfonyl, vinylsulfonyl, β-thiosulfatoethylsulfonyl, β-phenoxyethylsulfonyl and β-(dialkylamino)-ethylsulfonyl.

4,534,909

PROCESS FOR PRODUCING A HALOGEN-CONTAINING ETHYLBENZENE DERIVATIVE

Kiyotaka Oyama, Hikari, and Tuneo Harada, Shin-nanyo, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

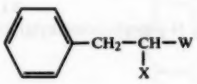
Filed Oct. 12, 1984, Ser. No. 660,087

Claims priority, application Japan, Oct. 13, 1983, 58-189857

Int. Cl.[3] **C07C** *121/66, 69/76, 53/134*

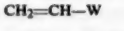
U.S. Cl. 260—465 G **19 Claims**

1. A process for producing a halogen-containing ethylbenzene derivative represented by the general formula:



(I)

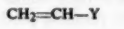
where X is a halogen atom, and W is a nitrile group, a carboxyl group, a lower alkoxycarbonyl group or an amidocarbonyl group, which comprises diazotizing aniline with a nitrite in a solution mixture comprising a hydrophilic organic solvent, an aqueous mineral acid solution and a vinyl compound represented by the general formula:



(II)

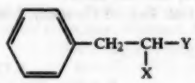
where W is as defined above, to form a benzenediazonium salt, and reacting the benzenediazonium salt, without isolating it from the reaction system, with said vinyl compound in the presence of halogen ions and a copper compound as a catalyst.

10. A process for producing a halogen-containing ethylbenzene derivative, which comprises diazotizing aniline with a nitrite in a solution mixture comprising a hydrophilic organic solvent, an aqueous mineral acid solution and a low boiling point vinyl compound represented by the general formula:



(III)

where Y is a nitrile group or a lower alkoxy carbonyl group, to form a benzenediazonium salt, then reacting the benzenediazonium salt, without isolating it from the reaction system, with said low boiling point vinyl compound and halogen ions in the presence of the halogen ions and a copper compound as a catalyst, to form a halogen-containing ethylbenzene derivative represented by the general formula:



(IV)

where X is a halogen atom, and Y is as defined above, subject-

ing the reaction mixture to distillation to recover the unreacted low boiling point vinyl compound, and recovering the halogen-containing ethylbenzene derivative from the distillation residue.

4,534,910

METHOD OF PREPARING ACETALS AND ENOL ETHERS FROM ACYLOXYMETHYLENE COMPOUNDS

Hermann Peeters, Niederkassel; Wilhelm Vogt, Cologne, and Christoph Theis, Bornheim, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany

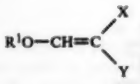
Filed Mar. 29, 1983, Ser. No. 480,153

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211679

Int. Cl.³ C07C *121/34, 69/76*

U.S. Cl. 260—465.6 **15 Claims**

1. A method for the preparation of an enol ether of the formula



I

wherein

R^1 represents straight-chain or branched alkyl moieties of 1 to 20 carbon atoms or $(CH_2)_m$—Cyc with Cyc=isocyclic or heterocyclic, mononuclear or polynuclear aromatic or cycloaliphatic ring systems bearing in some cases substituents on the rings, with m=0 to 5, the moieties $(CH_2)_nOR^4$ or $(CH_2—CH_2O)_nOR^4$ with n=1 to 4 and with R^4=straight-chain or branched alkyl moieties of 1 to 12 carbon atoms,

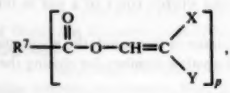
X represents CN or $COOR^1$ and

Y represents (X being) CN, $COOR^1$, (or R^3 being) H, straight-chain or branched moieties of 1 to 20 carbon atoms, straight chain or branched moieties

$(CH_2)_n$—Cn, $(CH_2)_nCOOR^4$, $(CH_2)_nNR^5_2$, $(CH_2)_mOR^4$ or $(CH_2)_m$Cyc,

n, m, R^4 and Cyc having the same meaning as above and R^5 alike or unalike H, straight-chain or branched alkyl moieties of 1 to 12 carbon atoms, Cyc or COR^6 and R^6=H, straight-chain or branched alkyl moieties of 1 to 12 carbon atoms or Cyc,

comprising the steps of reacting an acyloxymethylene compound of the formula



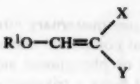
III

wherein X and Y have the meaning given above and R^7 represents straight-chain or branched alkyl, alkylene, alkenyl or alkenylene moieties of 1 to 12 carbon atoms, isocyclic or heterocyclic ring systems with monocyclic or polycyclic structure or $(CH_2)_n$Cyc, wherein n and Cyc have the meaning given above and R^7 represents straight-chain or branched alkyl, alkylene, alkenyl or alkenylene moieties of 1 to 12 carbon atoms, isocyclic or heterocyclic ring systems with monocyclic or polycyclic structure or $(CH_2)_n$Cyc, wherein n and Cyc have the meaning given above, and p=1 or 2, is reacted with an alcohol of the formula

R^1OH IV,

wherein R^1 has the meaning given above.

11. A method for the preparation of an enol ether of the formula



I

wherein

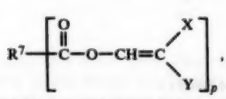
R^1 is alkyl of 1 to 4 carbon atoms, or alkyl of 2 to 3 carbon atoms and having an oxygen atom between two adjacent of the carbons;

X is CN or $COOR^1$;

Y is hydrogen, CN, $COOR^1$, R^1 or C_6H_5,

comprising the steps of

reacting an acyloxymethylene compound of the formula



III

wherein X and Y have the meaning given above and R^7 is an alkyl, alkylene, alkenyl or alkenylene moieties of 1 to 4 carbon atoms, Cyc or, $(CH_2)_n$Cyc, wherein n is 1, 2 or 3, Cyc is C_6H_5 and p=1 or 2,

with an alcohol of the formula

R^1OH IV,

wherein R^1 has the meaning given above,

at a temperature in the range of 20° to 250° C., and wherein the reactants are present in a molar ratio of acyloxymethylene to alcohol of 1:1 to 1:30.

14. The method of claim 11, wherein the alcohol is selected from methanol, ethanol, propanol, isopropanol, butanol, isobutanol or sec-butanol.

4,534,911

METHOD FOR THE PREPARATION OF P-BUTOXYPHENYLACETYL-HYDROXAMIC ACID IN THE FINELY DIVIDED STATE AND A COMPOSITION CONTAINING THIS ACID

Michel R. Franz, Berchem-Sainte-Agathe; Andreas B. Vincze, Woluwé-Saint-Lambert; Georges E. Lambelin, Forest, all of Belgium, and Alain V. Polat, Onex-Geneve, Switzerland, assignors to Continental Pharma, Inc., Vaduz, Liechtenstein

Filed Dec. 7, 1983, Ser. No. 558,885

Claims priority, application Luxembourg, Dec. 13, 1982, 84530

Int. Cl.³ C07C *83/10;* **A61K** *31/185*

U.S. Cl. 514—575 **10 Claims**

1. Method for the preparation of micronised p-butoxyphenylacetylhydroxamic acid, characterised in that it comprises dissolving the p-butoxyphenylacetylhydroxamic acid in a basic solution of salifying agent and then precipitating it in an acid solution in the presence of a surface-active agent the hydrolipophilic balance of which is between 10 and 18.

4,534,912

PREPARATION OF ANHYDRIDES

John Cook, Sproatley, England, assignor to BP Chemicals Limited, London, England

Filed May 17, 1984, Ser. No. 611,348

Claims priority, application United Kingdom, May 21, 1983, 8314137

Int. Cl.³ C07C *51/56*

U.S. Cl. 260—549 **10 Claims**

1. A process for the preparation of acetic anhydride by reacting at elevated temperature methyl acetate or dimethyl

ether with carbon monoxide characterised in that the reaction is carried out in the presence of an effective amount of a catalyst comprising:

(1) cobalt,

(2) a compound containing at least one quaternary nitrogen or phosphorus atom, wherein said compound containing at least one quaternary nitrogen or phosphorus atom is added as two precursors, the first being a trivalent nitrogen or phosphorus compound capable of forming the quaternary compound under the reaction conditions, the second being a halide-free quaternising agent, and

(3) a source of iodide or bromide wherein the atomic ratio of iodide or bromide to cobalt is from 0.5:1 to 5:1.

4,534,913

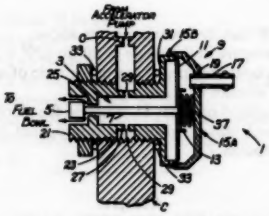
APPARATUS CONTROLLING DISCHARGE VOLUME OF A CARBURETOR ACCELERATOR PUMP

John G. Bathe, Taylor, Mich., assignor to ACF Industries, Inc., New York, N.Y.

Filed Jan. 23, 1984, Ser. No. 572,805

Int. Cl.³ F02M 7/08

U.S. Cl. 261—34 B **7 Claims**



1. Apparatus for use with a carburetor attached to an internal combustion engine for controlling the discharge volume of the carburetor's accelerator pump as a function of the engine operating condition comprising:

flow control means for controlling flow of fuel from a fuel discharge port of the accelerator pump to return fuel to a fuel bowl portion of the carburetor;

vacuum operated means for moving the flow control means from a first position blocking flow of fuel from the discharge port to a second position permitting fuel flow, the vacuum operated means including a diaphragm assembly one side of which is exposed to engine vacuum, a shank portion sized to be received in a bore formed in the side of the carburetor, the shank being hollow to form a portion of the return passage from the discharge port of the accelerator pump to the fuel bowl portion of the carburetor, the shank having a cylindrical groove therearound with a series of apertures circumferentially spaced for fuel to enter into the hollow shank;

switch means controlling application of a vacuum to the vacuum operated means; and,

means responsive to an engine operating condition for switching the switch means from a position in which vacuum is applied to the vacuum operated means to a position in which the vacuum operated means is exposed to atmosphere whereby the vacuum operated means moves the flow control means from its first to its second position.

4,534,914

METHOD AND APPARATUS FOR PRODUCING VORTEX RINGS OF A GAS IN A LIQUID

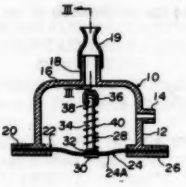
Masashi Takahashi, Yokohama, and Minoru Yamada, 309, Yamanouchi, Kamakura-shi, Kanagawa-ken, both of Japan, assignors to Nihon Sanso Kabushiki Kaisha and Minoru Yamada, both of, Japan

Filed Dec. 20, 1982, Ser. No. 451,409

Claims priority, application Japan, Dec. 23, 1981, 56-208638; Dec. 11, 1982, 57-217412

Int. Cl.³ B01F 3/04

U.S. Cl. 261—64 B **13 Claims**



1. An apparatus for producing vortex rings of a gas in a liquid, comprising:

(a) an accumulator including a gas inlet for introducing the gas under pressure from a gas supply source thereinto, and a gas outlet for discharging the gas;

(b) a nozzle attached to the outlet of the accumulator in communicating relation to the accumulator, the nozzle being of elasticity such that the nozzle is sealingly closed when the liquid pressure exceeds the gas pressure; and

(c) valve means, connected to the accumulator, for permitting a gas supply from the gas supply source to the nozzle and forming a gas stream at a higher velocity at the center of the nozzle than that at the inner periphery of the nozzle so that said vortex ring of the gas is formed; and

(d) means for actuating the valve means when gas pressure within the accumulator reaches predetermined pressure levels.

10. A method of producing vortex rings of a gas in liquid, comprising the steps of:

(a) positioning an accumulator in the liquid, the accumulator having a gas outlet and a valve member for closing the gas outlet;

(b) supplying the accumulator with the gas under pressure higher than that in the liquid surrounding the accumulator;

(c) providing the supplied gas to a nozzle communicated to the accumulator by bringing the valve member out of contact with the gas outlet thereby opening the nozzle instantaneously against the pressure in the surrounding liquid;

(d) then forming a gas stream at a higher velocity at the center of the nozzle than that at the inner periphery of the nozzle so that a vortex ring of the gas is formed;

(e) ejecting instantaneously the formed vortex ring from the nozzle into the liquid; and

(f) stopping instantaneously the gas supply to the nozzle to thereby close the nozzle by the pressure in the surrounding liquid.

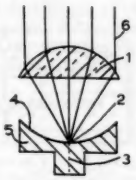
4,534,915
METHOD OF CONTROLLING THE ULTRAVIOLET POLYMERIZATION OF SPIN CAST LENSES

Charles W. Neefe, 811 Scurry St., Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 506,873, Jul. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 417,641, Sep. 9, 1982, Pat. No. 4,416,837. This application Aug. 17, 1984, Ser. No. 642,114

Int. Cl.³ B29D 11/00

U.S. Cl. 264—1.4 7 Claims



1. A method of polymerizing a spin cast lens in a rotating concave mold by providing a band of actinic light extending across the rotating lens monomer and passing through the center of the lens rotation whereby the rotating lens monomer near the center of rotation will receive more energy from the actinic light and polymerize before the rotating monomer further from the lens center of rotation.

4,534,916
METHOD FOR THE PREPARATION OF HYDROPHILIC GELS BY MONOMER CASTING

Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska, Prague, Czechoslovakia

Filed Apr. 6, 1984, Ser. No. 597,334

Claims priority, application Czechoslovakia, Aug. 17, 1983, 6009-83

Int. Cl.³ B29D 11/00

U.S. Cl. 264—2.1 19 Claims

1. In a process of preparing a hydrophilic gel article by monomer cast polymerization of a mixture containing a monoolefinic hydrophilic monomer in a plastic mold the improvement comprising including in the polymerizable monomer mixture a surface active agent in an amount effective to prevent grafting of the hydrophilic gel on the plastic mold.

4,534,917
METAL POWDERS AND A PROCESS FOR THE PRODUCTION THEREOF

Alfred Walz, Am Kurzarm 7, D-7830 Emmendingen, Fed. Rep. of Germany

Filed Mar. 29, 1984, Ser. No. 594,829

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1983, 3311343

Int. Cl.³ B05B 7/08

U.S. Cl. 264—12 9 Claims

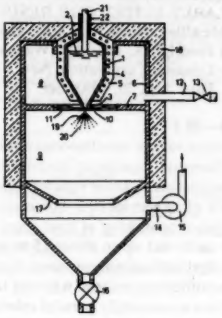
1. A process for the production of pore-free metal powders, said powders consisting of powder particles having a singly curved smooth surface and a mean diameter of between 5 and 35 microns; said process comprising the steps of:

providing a container, said container having an inflow opening;

flowing metal melt and gas into said container through said inflow opening;

maintaining the ratio of gas pressure within said container to gas pressure outside said container at said inflow opening at less than 1:5, thereby creating a supersonic flow of gas from outside said container, through said inflow opening, and into said container;

contacting said flowing metal melt with said supersonic flow of gas at a point near said inflow opening;



whereby said metal melt, after contacting said supersonic flow of gas, forms into threads which subsequently and spontaneously collapse to form said powder particles.

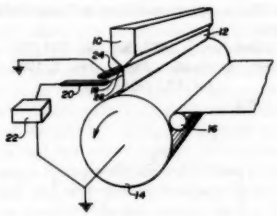
4,534,918
METHOD AND APPARATUS FOR THE ELECTROSTATIC PINNING OF POLYMERIC WEBS

Albert W. Forrest, Jr., Chillicothe, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 27, 1983, Ser. No. 546,104

Int. Cl.³ B29D 7/22

U.S. Cl. 264—22 7 Claims



1. In a pinning apparatus including a moving conductive grounded support for a polymeric web, an elongated charged electrode extending transversely of the support and a grounded electrode parallel therewith, the improvement comprising provision of conductive pins projecting from said grounded electrode, said pins having points located adjacent the charged electrode whereby to stabilize the flow of current between said electrodes.

6. In a method including the steps of advancing a freshly cast polymeric web to a moving support and establishing electric fields between first and second electrodes as well as between the first electrode and the support, the improvment comprising the step of localizing the flow of current between the two electrodes at spaced points along the length thereof.

4,534,919

PRODUCTION OF A CARBON FIBER MULTIFILAMENTARY TOW WHICH IS PARTICULARLY SUITED FOR RESIN IMPREGNATION

J. Eugene McAliley, Rock Hill, S.C.; Gene P. Daumit, Charlotte, and Fredrick A. Ethridge, Waxhaw, both of N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 30, 1983, Ser. No. 527,728
Int. Cl.³ D01F 9/12
U.S. Cl. 264—29.2 26 Claims

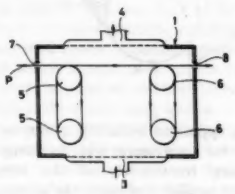
1. In a process for the simultaneous conversion of a plurality of acrylic filaments capable of undergoing conversion to a carbonaceous fibrous material selected from the group consisting essentially of an acrylonitrile homopolymer and an acrylonitrile copolymer containing at least about 85 mole percent of acrylonitrile units and up to about 15 mole percent of one or more monovinyl units copolymerized therewith, while in the form of a multifilamentary tow wherein the filaments therein are disposed in a substantially parallel relationship wherein said multifilamentary tow is passed in the direction of its length through a plurality of heating zones each containing a heated gaseous atmosphere while substantially suspended therein to form a multifilamentary fibrous product which contains at least 70 percent carbon by weight; the improvement of subjecting said multifilamentary tow during at least one stage in its processing to the impingement of at least one stream of a liquid whereby the parallel relationship of said filaments is disrupted in the substantial absence of filament damage with the filaments becoming decolumnized to a degree sufficient to enable said resulting carbonaceous fibrous material to be more readily impregnated by and dispersed within a matrix-forming resin.

4,534,920

PROCESS FOR PRODUCING CARBONIZABLE OXIDIZED FIBERS AND CARBON FIBERS

Minoru Yoshinaga; Nobuyuki Matsubara, and Ryuichi Yamamoto, all of Ehime, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 7, 1983, Ser. No. 501,911
Claims priority, application Japan, Jun. 7, 1982, 57-96303
Int. Cl.³ D01F 9/22
U.S. Cl. 264—29.2 18 Claims



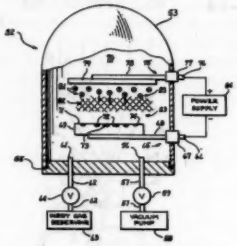
1. A process for producing carbonizable oxidized fibers, which comprises oxidizing precursor fibers in an oxidizing atmosphere containing an oxidizing gas heated to about 240° to 400° C. by intermittently contacting and removing said precursor fibers on and from a cooling means positioned inside said oxidizing atmosphere, wherein the contact time per single contact of said precursor fibers with the cooling means is from about 0.1 to about 3 seconds, and the temperature drop caused by said contact is about 5° to about 30° C.

4,534,921

METHOD AND APPARATUS FOR MOLD CLEANING BY REVERSE SPUTTERING

Richardus H. J. Fierkens, Herwen, and Ireneus J. T. M. Pas, Rozendaal, both of Netherlands, assignors to ASM Fico Tooling, b.v., Herwen, Netherlands

Filed Mar. 6, 1984, Ser. No. 586,853
Int. Cl.³ B29C 6/04; C23C 15/00
U.S. Cl. 264—39 20 Claims



1. A method of cleaning molds comprising the steps of:
providing a vacuum chamber;
transporting a mold to be cleaned to the vacuum chamber;
evacuating the chamber;
admitting an ionizible gas to the vacuum chamber; and
bombarding the mold surfaces to be cleaned with ions for removing surface contaminates by reverse sputtering.

8. In a method for encapsulating the integrated circuit and input/output lead portion of a lead frame assembly within a plastic encapsulating material including the steps of accurately positioning a lead frame assembly within the lower mold portion, placing the upper mold portion over the lower mold portion, feeding plastic material into the mold cavity, heating and applying pressure to the plastic material for melting same and causing the plastic material to flow over the portions to be encapsulated, curing the encapsulated lead frame assemblies, separating the upper and lower mold portions, cleaning the separated mold portions, and subsequently reusing the cleaned mold portions in a continuous encapsulating process, the improvement residing in said cleaning step and comprising:
transporting the upper and lower mold portions to be cleaned to a cleaning station; and
reverse sputtering the mold portions to clean surface contaminates and the like therefrom prior to reuse.

14. In a system for continuously encapsulating the integrated circuit portion and input/output lead portion of a lead frame assembly including means for locating the lead frame assembly in a lower mold portion, means for positioning and securing an upper mold portion over said lower mold portion to form a mold assembly, means for supplying plastic encapsulating material into a mold cavity of the mold assembly, means for heating and pressurizing the plastic material for flowing the molten plastic over the portions of the lead frame assembly to be encapsulated, means for curing the encapsulated lead frame assembly, means for separating the upper mold portion from the lower mold portion, means for removing the encapsulated lead frame assembly from the lower mold portion, and means for cleaning the mold portions prior to subsequent reuse, improved cleaning means for removing the remaining plastic material, plastic residue, and surface contamination such as dirt, oil, grease, dust, oxidation products, CF_4, and the like from at least selected surfaces of the mold portions prior to subsequent reuse comprising:
vacuum enclosure means;
means for positioning a mold portion to be cleaned within said vacuum enclosure means;
means for producing a substantial vacuum in said vacuum enclosure means;

means for introducing an inert ionizible gas into said vacuum chamber

means for generating a plasma field within said vacuum chamber for ionizing said gas; and

means for bombarding the selected surface areas of the mold portions to be cleaned with ions for removing the surface contaminates therefrom.

4,534,922

GASKETS

Alan W. Atkinson, Rochdale; Katryna J. Dearden, and Janet M. Lancaster, both of Littleborough, all of England, assignors to T&N Materials Research Limited, Manchester, England

Filed Sep. 29, 1983, Ser. No. 536,975

Claims priority, application United Kingdom, Oct. 1, 1982, 8228155

Int. Cl.³ D04H *1/54*

U.S. Cl. 264—119 **9 Claims**

1. A method of making a gasket having improved release characteristics for use in a joint between mating pairs, the gasket made from exfoliated graphite by a process comprising the steps of:

(1) forming a gasket from exfoliated graphite particles,

(2) pressing the gasket thus formed, and thereafter

(3) embossing the gasket by pressing against surface means having a profile such that the substrate pressed is given a pattern of relatively raised areas surrounded by predominantly interconnected depressions distributed uniformly over the gasket surfaces, the raised areas being spaced apart from each other so as to provide improved release characteristics from the mating parts.

4,534,923

METHOD AND APPARATUS FOR FORMING A DOUBLE WALLED THERMOPLASTIC TUBE WITH INTEGRAL BELLS

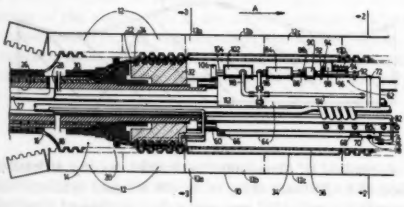
Manfred A. A. Lupke, 10 McLeary Ct., Concord, Ontario, Canada L4K 2Z3

Filed Nov. 3, 1983, Ser. No. 548,453

Claims priority, application Canada, Dec. 2, 1982, 416840

Int. Cl.³ B29C *17/07, 17/14;* B29D *23/04*

U.S. Cl. 264—156 **10 Claims**



1. A method of forming a double walled thermoplastic tube by extruding a first tube into travelling mold, molding the first tube in the mold to form a corrugated outer wall, and extruding a second tube into the first tube to form a smooth inner wall, the method being characterized by the steps of:

molding integral bell sections into the outer wall;

piercing one of the tubes between the ends of each outer wall bell section so as to allow the escape of air from between the inner and outer walls; and

pressing the inner wall into continuous contact with the outer wall along each outer wall bell section.

4. An apparatus for forming a double walled thermoplastic tube with a corrugated outer wall and a smooth inner wall, the apparatus including a travelling mold with a corrugated cavity, extruder means for extruding a first tube into the mold cavity and a second tube into the first tube, means for molding the first tube to form a corrugated outer wall and means for forming the second tube into a smooth inner wall, the apparatus being characterized by means for forming integral bells in the double walled tube, comprising the combination of:

means for molding integral bell sections into the outer wall;

piercing means for piercing one of the tubes between the ends of each outer wall bell section; and

pressing means for pressing the inner wall into continuous contact with each bell section of the outer wall.

4,534,924

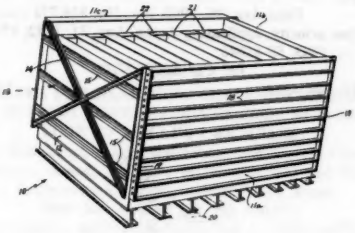
METHOD FOR MOLDING CONCRETE SLABS AND BATTERY MOLD THEREFOR

Joseph A. Kariakin, Salem, Oreg., assignor to Novi Development Corporation, Salem, Oreg.

Filed Sep. 19, 1983, Ser. No. 533,431

Int. Cl.³ B28B *1/16*

U.S. Cl. 264—259 **18 Claims**



13. A method of molding concrete slabs comprising:

(a) providing a unitary battery box with two sidewalls, a bottom wall perpendicular to and extending between said sidewalls and an end wall perpendicular to said sidewalls and bottom wall and extending between said sidewalls;

(b) arranging said battery box at a slight tilted angle whereby said end wall is tilted at a slight angle from the vertical and said bottom is tilted at the same said slight angle from the horizontal with said sidewalls being vertical;

(c) spacedly positioning one at a time a plurality of separator plates from one another within said unitary battery box so that a cavity is formed between adjacent plates, and such that said plates are substantially perpendicular to and extend between said two sidewalls and are substantially parallel to said end wall whereby said plates are each tilted and the angle of tilt is the same as said tilted angle of said bottom and end walls, such angle of tilt being slight but sufficient without any additional support to maintain said plates in said box before pouring of concrete therein;

(d) applying a force to the separator plate furthest removed from said end wall thereby holding all of said separator plates in place within said unitary battery box in spaced position; and

(e) pouring concrete into the cavities between said plates.

4,534,925

UNINHIBITED BENTONITE COMPOSITION

Todd D. Harriett, Chicago, Ill., assignor to American Colloid Company, Skokie, Ill.

Filed Nov. 22, 1982, Ser. No. 443,225

Int. Cl.³ C08K *3/34;* C08J *3/18*

U.S. Cl. 264—281 **21 Claims**

1. A water-swellable clay composition comprising water-swellable smectile clay in an amount of 75 to 90% by weight; and polypropene, polybutene or mixtures thereof in an amount of 10% or more by weight.

4,534,926

UNINHIBITED BENTONITE COMPOSITION

Todd D. Harriett, Chicago, Ill., assignor to American Colloid Company, Skokie, Ill.

Continuation-in-part of Ser. No. 443,225, Nov. 22, 1982,. This application Apr. 27, 1984, Ser. No. 604,990

The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.

Int. Cl.[3] C08K 3/34; C08J 3/18

U.S. Cl. 264—281 18 Claims

1. A water-swellable clay composition having essentially no silicic filler comprising water-swellable smectite clay in an amount of 35 to 90% by weight; and polypropene, polybutene or mixtures thereof in an amount of 10% to 65% by weight.

4,534,927

METHOD AND APPARATUS FOR MANUFACTURING CUPS HAVING A LIP

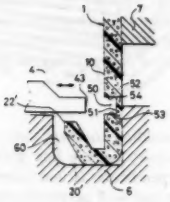
Kazumasa Morioka, and Toru Yoshimi, both of Koga, Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Aug. 26, 1983, Ser. No. 526,775

Claims priority, application Japan, Aug. 31, 1982, 57-151966; Mar. 11, 1983, 58-41048

Int. Cl.[3] B29D 27/00

U.S. Cl. 264—321 15 Claims



1. A method of manufacturing cups having a lip, which comprises the steps of:

(a) forming a pre-formed up from a thermoplastic resin foamed sheet material, the side wall and bottom of the preformed cup being formed integrally at a molding temperature above the softening point of the foamed sheet material, a radially outwardly extending rim provided at the top of an opening defined by the side wall, said rim extending substantially downwardly at the end thereof,

(b) heating the side wall to a temperature within a range of temperatures above the heat deformation temperature for the material and below said molding temperature,

(c) melt-forming a bending furrow on the outer periphery of the side wall, and

(d) bending the rim on said bending furrow outwardly and down and turning the end of the rim toward the side wall.

4,534,928

MOLDING PROCESS USING ROOM TEMPERATURE CURING SILICONE COATINGS TO PROVIDE MULTIPLE RELEASE OF ARTICLES

David L. Martin, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 19, 1983, Ser. No. 562,760

Int. Cl.[3] B28B 7/36

U.S. Cl. 264—334 8 Claims

1. In a method for molding articles comprising placing a molding composition in a mold, converting the molding composition to a solid molded article and thereafter separating the solid molded article from the mold, the improvement comprising applying a silicone mold release composition to at least one shape-determining surface of the mold, and thereafter curing the silicone mold release composition before the molding composition is placed in contact therewith, wherein the silicone mold release composition is stable if stored in containers that exclude moisture, cures when exposed to moisture, and is obtained by mixing components consisting essentially of

(I) a polydimethylsiloxane represented by the general formula

$$Y[(CH_3)_2SiO]_kH$$

in which Y is a methyl or hydroxyl radical with the stipulation that at least 80 percent of Y are hydroxyl radicals and k has an average value greater than 20;

(II) an alkoxysilane represented by the general formula

$$(RO)_nSiR'_{4-n}$$

wherein R is a methyl, ethyl, propyl or methoxyethyl radical, R′ is a monovalent hydrocarbon radical or halogenated hydrocarbon radical having 1 to 4 carbon atoms, and n has a value of 3 or 4;

(III) a metal alkoxide selected from the group consisting of tetraalkyltitanates, tetraalkylgermanates, tetraalkylzirconates and vanadium trialkoxide oxides; and

(IV) a non-reactive, volatile organic solvent which is substantially water free,

the components being mixed in amounts of 25 to 98 parts by weight of (I), 1.5 to 65 parts by weight of (II), and 0.3 to 18 parts by weight of (III) for every 100 parts by weight of (I) plus (II) plus (III).

4,534,929

MATRIX AND METHOD OF USING AN ALIPHATIC ALCOHOL COATED SILICA GLASS MATRIX

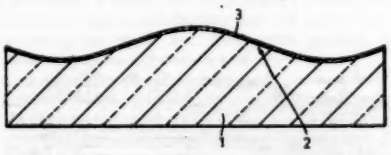
Johannes J. Ponjeé, and Christiaan J. A. Verwijlen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1983, Ser. No. 510,101

Claims priority, application Netherlands, Apr. 27, 1983, 8301482

Int. Cl.[3] B29C 1/04

U.S. Cl. 264—338 6 Claims



1. A method of manufacturing articles having at least one surface of a synthetic resin, in which a liquid synthetic resin composition is provided on a silica glass surface of a matrix, a supporting member is positioned in contact with a surface of said liquid synthetic resin composition, the liquid synthetic resin composition is converted into a solid synthetic resin layer and the solid synthetic resin layer, in which the configuration of the matrix surface is copied, and to which synthetic resin layer the supporting member adheres, is removed from the matrix, characterized in that a monolayer of an aliphatic alcohol, the aliphatic moiety of which is selected from the group consisting of alkyls of at least 8 carbon atoms and fluoroalkyls, is bound to said silica glass surface during said manufacture.

2. A matrix suitable for the manufacture of products having at least one surface of a synthetic resin, said matrix comprising a silica glass surface for contacting a surface of said synthetic resin during said manufacture, characterized in that during said manufacture said silica glass surface is provided with a releasing agent consisting of a monolayer of an aliphatic alcohol bound to said silica glass surface, the aliphatic moiety of said

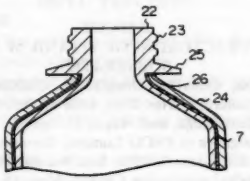
alcohol being selected from the group consisting of alkyls of at least 8 carbon atoms and fluoroalkyls.

4,534,930

PROCESS FOR PRODUCING STRETCHED MULTILAYER POLYESTER BOTTLE

Shigezo Nohara, Yokohama, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Feb. 28, 1984, Ser. No. 584,515
Claims priority, application Japan, Feb. 28, 1983, 58-31033
Int. Cl.³ B29C *17/07*; B29D *9/04*; B29F *1/10*
U.S. Cl. 264—513 **5 Claims**



1. A process for producing a stretched multilayer polyester bottle which comprises axially stretching a bottomed multilayer preform comprised of an inside and an outside polyester surface layer and an interlayer of a gas-barrier resin provided therebetween optionally through an adhesive layer under conditions which induce molecular orientation of the polyester and simultaneously stretching it circumferentially by blowing; wherein said multilayer preform is produced by coating a solution or emulsion of an ethylene-vinyl alcohol copolymer on one surface of a primary preform of the polyester molded in advance, drying the coated preform at a temperature at which no whitening owing to the crystallization of the polyester occurs to thereby form a thin but continuous film of the ethylene-vinyl alcohol polymer on the primary preform, the coated film of the ethylene-vinyl alcohol copolymer having such a thickness distribution that its thickness at the bottom portion of the preform is greater than the thickness of its upper end at the side wall portion of the preform sufficient to prevent extreme thinning of the coated film at the bottom portion incident to the subsequent injecting step, mounting the coated preform on an injection mold, and injecting the polyester onto the coated layer to form the inside or outside surface layer of the polyester.

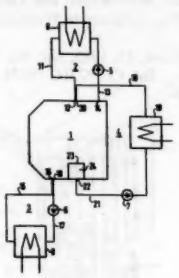
4,534,931

INSTALLATION FOR COOLING A FUEL ELEMENT STORAGE WELL WITH SEVERAL WATER CIRCUITS

Wilfried Schneider, Grosskrotzenburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 379,572, May 18, 1982, abandoned. This application Jul. 23, 1984, Ser. No. 633,078
Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120106
Int. Cl.³ G21C *19/08*
U.S. Cl. 376—272 **4 Claims**

1. Installation for cooling fuel elements, comprising a water-filled open-top fuel element storage well, a plurality of separate water-filled cooling circuits having drain lines with connections to the well, pumps connected to said drain lines, heat exchangers connected to said pumps and feed lines being connected to said heat exchangers and having connections to the well, one of said cooling circuits having its connections of its feed line and drain line to the well being disposed at a level which is higher than the others of said drain line and feed line connections, and a downwardly directed pipe disposed in said storage well being connected to the drain line connection of said one cooling circuit and having a lower opening formed



therein at a lower level than all of said drain line and feed line connections.

4,534,932

APPARATUS FOR REMOVING CLADDING MATERIAL FROM BOTTOM PORTION OF CONTROL ROD GUIDE TUBE OF NUCLEAR REACTOR

Kazuaki Yoshikawa; Yuichi Matsumura, and Noriaki Mase, all of Hitachi, Japan, assignors to Hitachi, Ltd and Hitachi Service Engineering Co., Ltd., both of Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,404
Claims priority, application Japan, Jun. 3, 1983, 58-97871
Int. Cl.³ G21C *19/42*
U.S. Cl. 376—310 **7 Claims**

1. An apparatus for removing a cladding material from a bottom portion of a control rod guide tube of a nuclear reactor, comprising:

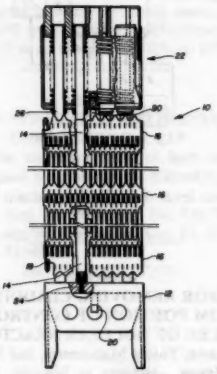
a rotor tube removably mounted in a housing of a control rod drive of the nuclear reactor and having at least at a forward end portion hydraulically insertable into the bottom portion of the control rod guide tube through an opening located in a lower portion of the control rod guide tube for inserting the control rod drive, said rotor tube having a foldable rotary brush and cleaning water supply nozzles provided at the forward end portion thereof; and

a rotary drive shaft extending through the rotor tube for rotating the rotary brush.

4,534,933
NUCLEAR REACTOR FUEL ASSEMBLY WITH IMPROVED TOP NOZZLE AND HOLD-DOWN MEANS

Robert K. Gjertsen, Monroeville, and Luciano Veronesi, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 17, 1983, Ser. No. 542,625
Int. Cl.[3] G21C 19/28
U.S. Cl. 376—364 14 Claims



1. A fuel assembly for a nuclear reactor including a bottom nozzle, at least one longitudinally extending control rod guide thimble attached to and projecting upwardly from the bottom nozzle, a plurality of transverse grids axially spaced along said thimble for supporting an array of upstanding fuel rods, and an improved top nozzle with hold-down means attached to the upper end of said thimble in forming an integral assembly, said improved top nozzle with hold-down means comprising:

(a) a lower adapter plate having a guide thimble hole for receiving said guide thimble so as to mount said adapter plate on said guide thimble for slidable movement therealong;

(b) first retainer means on said thimble for limiting downward movement of said adapter plate along said thimble,

(c) an upper hold-down plate having a guide thimble passageway with an internal ledge for receiving said thimble so as to mount said hold-down plate on said thimble for slidable movement therealong, said internal ledge being located in a lower portion of said passageway;

(d) second retainer means on said thimble being disposed within said passageway above said ledge therein and cooperable with said ledge for limiting the upward movement of said hold-down plate along said thimble; and

(e) spring means coiled about said thimble and interposed between said lower adapter plate and said upper hold-down plate for yieldably retaining said ledge in abutting engagement with said second retainer means.

4,534,934
AXIAL SWEEP-THROUGH PROCESS FOR PREPARING DIAMOND WIRE DIE COMPACTS

Hyun S. Cho, Worthington, Ohio, assignor to General Electric Company, Worthington, Ohio

Continuation of Ser. No. 126,050, Feb. 29, 1980, abandoned.
This application Oct. 20, 1981, Ser. No. 313,119
Int. Cl.[3] B22F 5/00, 7/06; B21K 5/20
U.S. Cl. 419—6 12 Claims

1. An improved process for preparing diamond wire die compacts characterized by diamond-to-diamond bonding which comprises subjecting at least one mass comprised of a metal carbide cylinder having at least one hole extending through its thickness connecting the two ends and containing diamond particles in said holes to the following high pressure-high temperature sintering conditions:

pressure of at least 50 kbar at a temperature of at least 1300° C. and within the diamond stable region; and

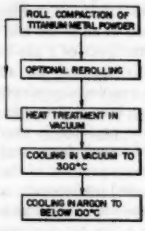
reaction time of 10–90 minutes;

in a high pressure reaction cell containing each mass of metal carbide and diamond particles within a sub-assembly comprising a shield metal cup and a shield metal disc covering the open end of the cup; wherein the improvement comprises using a sub-assembly in which has been placed on one end of the mass of metal carbide and diamond a layer comprised of a diamond catalyst/solvent whereby axial diffusion of the catalyst/solvent into the diamond is achieved.

4,534,935
MANUFACTURING OF TITANIUM ANODE SUBSTRATES

John Ambrose, Oakville; Douglas K. Charles, Mississauga; Bruce R. Conard; Carlos Diaz, both of Oakville; Charles E. O'Neill, Mississauga, and Wayne P. Leavoy, Sudbury, all of Canada, assignors to INCO Limited, Toronto, Canada

Filed Jan. 9, 1984, Ser. No. 569,268
Claims priority, application Canada, Mar. 16, 1983, 423746
Int. Cl.[3] B22F 3/26, 3/18, 3/12
U.S. Cl. 419—23 9 Claims


ROLL COMPACTION OF TITANIUM METAL POWDER
OPTIONAL REROLLING
HEAT TREATMENT IN VACUUM
COOLING IN VACUUM TO 300°C
COOLING IN ARGON TO BELOW 100°C

1. A process for producing electrode substrate comprising compacting sponge titanium powder to an appropriate form having a density of about 60% to about 80% of titanium metal, thereafter heat treating the thus compacted powder form at a temperature of about 500° to about 750° C. for at least one hour under conditions so as to avoid the formation of non-elemental species of titanium and cooling the thus compacted and heat treated form under conditions so as to avoid the formation of non-elemental species of titanium to a temperature of about 100° C., to thereby provide an electrode substrate having physical and mechanical properties and characteristics amenable to commercial use as an electrode including inherently low electrical resistivity that enables satisfactory current distribution over the complete surface of the electrode.

4,534,936
METHOD FOR REMOVAL OF ORGANIC BINDING AGENTS FROM MOLDED BODIES

Elis Carlström; Agneta I. Johnsson, and Leif A. G. Hermansson, all of Swedish Institute for Silicate Research, Box 5403, S-402 29 Gothenburg, Sweden

Filed Jun. 9, 1983, Ser. No. 508,455
Int. Cl.[3] B22F 3/00
U.S. Cl. 419—36 11 Claims

1. A method of optimizing the removal of a temporary binder from a formed powder compact comprising heating of the powder compact in an inert or reactive gas or vacuum, monitoring the weight loss of the compact, and regulating the heating proportional to the difference between a preset weight-loss rate value and the actual process weight-loss rate value, the preset weight-loss rate value being below the rate above

which cracks, blisters or other defects appear in the powder compact.

4,534,937

PROCESS FOR SINTERING ALUMINUM ALLOY POWDERS UNDER PRESSURE

Jean Meunier, Voreppe, and Marc Salesse, Paris, both of France, assignors to Cegedur Societe de Transformation de L'Aluminium Pechiney, Paris, France

Filed Mar. 29, 1983, Ser. No. 479,900
Claims priority, application France, Mar. 10, 1983, 83 04343
Int. Cl.³ F16N *15/08*
U.S. Cl. 419—42 **10 Claims**

1. A process for sintering aluminum alloy powders under pressure in a capsule which comprises:

(a) coating the entire surface of the capsule containing said aluminum alloy powders with a vitreous material having a viscosity of 100–100,000 poises at the sintering temperature; and

(b) compressing said coated capsule in a unidirectional press and heating said capsule at a temperature of 450°–550° C., thereby sintering said alloy powders.

4,534,938

METHOD FOR MAKING ALLOY ADDITIONS TO BASE METALS HAVING HIGHER MELTING POINTS

Howard B. Bomberger, Canfield, and Francis H. Froes, Xenia, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 15, 1984, Ser. No. 640,916
Int. Cl.³ C22C *1/03, 9/00, 14/00, 30/00*
U.S. Cl. 420—590 **15 Claims**

1. A method for alloying at least one first metal having a density less than 7.2 g/cc and a melting point below 900° C. with a base metal having a density greater than 1.8 g/cc and a melting point greater 1000° C., said base metal comprising one or more metals selected from the group consisting of Ti, Zr, Nb, Ta, Cr and W, which comprises forming a composition of said base metal with a melting point lowering amount of a melting point-lowering element, whereby the resulting composition has a melting point below the boiling point of said first metal, melting said composition and mixing said first element therewith, and solidifying the resulting alloy.

4,534,939

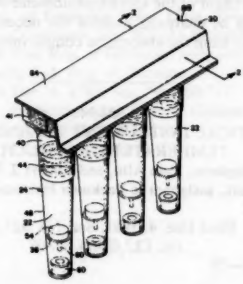
GAS FLOW CARTRIDGE WITH IMPROVED COAGULATION DETECTION AND EXPANDED ANALYTICAL TEST CAPABILITY

Leland B. Smith, Englewood, and Jacqueline J. Jackson, Denver, both of Colo., assignors to Hemotec, Inc., Englewood, Colo.

Filed Oct. 15, 1982, Ser. No. 434,558
Int. Cl.³ G01N *33/48*
U.S. Cl. 422—61 **25 Claims**

1. In a cartridge defining a reaction chamber in which to hold a pool of blood or a blood derivative during a coagulation analytical test, a reagent chamber to hold a liquid reagent, means separating the reaction chamber and the reagent chamber, and means for intercommunication of the reaction chamber and the reagent chamber, an improvement comprising:

means containing a pre-determined quantity of activator agent within the reaction chamber said means being designed to release the activator agent into the blood or the blood derivative when the reaction chamber is intercommunicated with the reagent chamber to intermix the reagent with the pool of blood or the blood derivative.

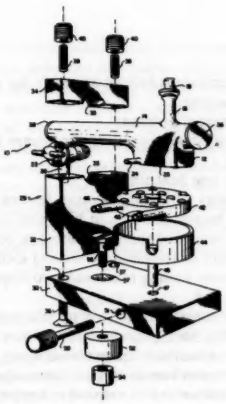


4,534,940

ATOMIC ABSORPTION SPECTROPHOTOMETRIC MEASUREMENT OF MERCURY

Denis R. Bourcier, Logan, Utah, assignor to Utah State University Foundation, Logan, Utah

Filed Mar. 26, 1982, Ser. No. 362,501
Int. Cl.³ G01N *21/31*
U.S. Cl. 422—68 **15 Claims**



1. An apparatus for measurement of mercury by an atomic absorption spectrophotometer, comprising:

an absorption chamber adapted for use in the spectrophotometer;

a mixing chamber adjacent and connected to the absorption chamber into which a sample to be analyzed and a reductant are added, said mixing chamber being integral with and forming a portion of the absorption chamber such that the mixing chamber and the absorption chamber are mountable within the absorption compartment of the spectrophotometer;

an inlet port for introducing the sample and the reductant into the mixing chamber; and

an outlet port for removal of the sample and the reductant from the mixing chamber, said outlet port being positioned such that negative pressure is used to remove the

sample and the reductant after the measurement is completed;

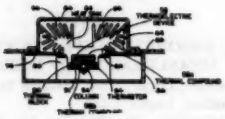
wherein samples may be added to and removed from said apparatus while said apparatus is mounted within the absorption compartment of the spectrophotometer such that multiple samples may be analyzed without the necessity of removing the apparatus from the absorption compartment of the spectrophotometer.

4,534,941

ANALYTICAL INSTRUMENT THERMOELECTRIC TEMPERATURE REGULATOR

Donald E. Stephens, Palo Alto, and Robert J. Ehret, Los Altos, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 4, 1981, Ser. No. 327,372
Int. Cl.³ G01N *31/08*
U.S. Cl. 422—70 **9 Claims**



1. A temperature regulator assembly for use in an analytical device comprising:

(a) an elongated column;

(b) thermally conductive support means for supporting said column;

(c) at least one heat sink;

(d) a plurality of thermoelectric devices connected to said support means and to said heat sink for conducting heat therebetween and thereby heating or cooling said column;

(e) a plurality of temperature sensing elements connected in temperature sensing relationship to respective parts of said column; and

(f) control means responsive to said sensing elements for controlling said plurality of thermoelectric devices to maintain a uniform temperature along said column, said control means acts in conjunction with individual control circuits connected to respective temperature sensing elements and respective thermoelectric devices.

4,534,942

APPARATUS FOR REDUCING THE CHANCES OF IGNITION AND EXPLOSION FROM THE DECOMPOSITION OF HIGH-PRESSURE INDUSTRIAL PROCESS ETHYLENE GASES

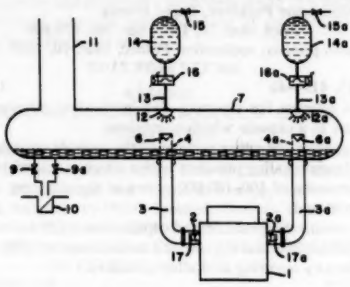
Daniel Grasset, Par Lillebonne, and Bernard Martinot, Lillebonne, both of France, assignors to Societe Chimique des Charbonnages--CdF CHIMIE, Paris, France

Continuation of Ser. No. 143,631, Apr. 25, 1980, abandoned.
This application Aug. 10, 1982, Ser. No. 406,997
Claims priority, application France, Apr. 25, 1979, 79 10442
Int. Cl.³ G05B *9/00*; C08F *2/34*; C08G *85/00*
U.S. Cl. 422—117 **24 Claims**

1. In combination, a high-pressure vessel operating at a pressure of at least 100 bars and an apparatus for evacuating the decomposition gases of ethylene contained in said high-pressure vessel, said apparatus being adjacent to said vessel and comprising:

(a) means defining a reservoir with a volume between 2 and 100 times that of the vessel;

(b) conduit means connecting and communicating said vessel to said reservoir means and having at least one safety means separating said apparatus from said vessel for releasing said decomposition gases from said vessel, said conduit means being located at least in part outside of both



said vessel and said reservoir means whereby said vessel and said reservoir means are in a spaced-apart relationship, said conduit means constituting means for passing said decomposition gases released from said vessel to said reservoir means;

(c) at least one vertically oriented chimney connecting the reservoir means to the atmosphere; and

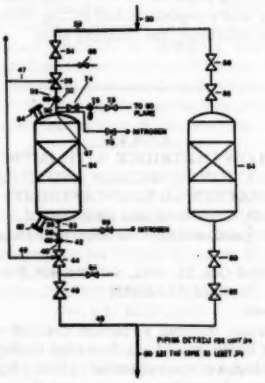
(d) a sealing means across the entire cross-section of said chimney, whereby an inert atmosphere is provided within said chimney.

4,534,943

APPARATUS FOR CATALYTIC REFORMING WITH CONTINUOUS SULFUR REMOVAL

William J. Novak, Guttenberg, and Ronald G. McClung, Bridgewater, both of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Filed Feb. 21, 1984, Ser. No. 582,123
Int. Cl.³ B01J *8/02*
U.S. Cl. 422—188 **1 Claim**



1. An apparatus for removing residual sulfur from naphtha to be fed to a reformer comprising:

a primary absorber having a charge of manganous oxide

disposed therein; a bypass absorber having a charge of manganous oxide disposed therein; the volume of the bypass absorber being no more than about one-fourth the volume of the primary absorber; entrance duct means for passing naphtha through said primary absorber, said entrance duct means having at least one entrance seal double seat double gate wedge valve means disposed therein for interrupting flow through said primary absorber and at least one entrance seal collar means mounted on said entrance duct means adapted to receive a blind seal plate means mountable thereon locatable in said entrance duct means between said primary absorber and said entrance seal double seat double gate wedge valve means; exit duct means for withdrawing desulfurized naphtha from said primary absorber, said exit duct means having at least one exit seal double seat double gate wedge valve means disposed therein for interrupting flow through said primary absorber and at least one exit seal collar means mounted on said exit duct means adapted to receive a blind seal plate means mountable thereon locatable in said exit duct means between said primary absorber and exit seal double seat double gate wedge valve means; flare means operably associated with said primary absorber; means for passing nitrogen through said primary absorber to said flare means and purging said primary absorber when said entrance seal and exit seal double seat double gate wedge valve means are closed and said entrance seal and exit seal collar means each have blind seal plate means mounted thereon; means for supplying a nitrogen purge between the gates of each of said entrance seal and exit seal double seat double gate wedge valve means and urging each of said gates against its respective seat; means for withdrawing manganous oxide from said primary absorber into vessels having an inert atmosphere therein; and means for diverting flow of naphtha through said bypass absorber while said entrance seal and exit seal double seat double gate wedge valve means are in their closed position.

4,534,944

MERCURY VAPOR SUPPRESSANT

Richard H. Roydhouse, Vancouver, Canada, assignor to Environmental Protection Systems, Limited, Vancouver, Canada

Filed Oct. 31, 1983, Ser. No. 546,886

Claims priority, application Canada, Nov. 4, 1982, 414904

Int. Cl.³ B01D *53/34;* C09K *3/32*

U.S. Cl. 423—210 **15 Claims**

10. A process for absorbing mercury that comprises contacting the mercury with a composition that comprises a polyhydric alcohol as a liquid carrier and containing copper ions and thiosulphate ions.

4,534,945

STABILIZATION OF HIGH PURITY HYDROGEN PEROXIDE

Quentin G. Hopkins, and Jhonce N. Browning, both of Charleston, W. Va., assignors to FMC Corporation, Philadelphia, Pa.

Filed May 3, 1984, Ser. No. 606,784

Int. Cl.³ C01B *15/02*

U.S. Cl. 423—273 **8 Claims**

1. A 25% to 35% aqueous solution of hydrogen peroxide stabilized against decomposition in the presence of polyvalent cations so as to exhibit a maximum residue on evaporation of 20 mg/l comprising as a stabilizer 0.1 to 1.4 mg/kg of tin, 0.1 to 2.5 mg/kg of phosphate added as an organic phosphonic acid and 0.1 to 5.5 mg/kg of citric acid.

4,534,946

PROCESS FOR MAKING ALKALI METAL POLYPHOSPHATES

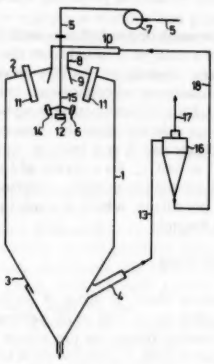
Ben Damman, Middelburg; Hans Scheffer, Vlissingen; Paul de Witte, Westkapelle, all of Netherlands; Johannes Kraiise, Hürth, Fed. Rep. of Germany; Hans Haas, Swisttal-Strassfeld, Fed. Rep. of Germany, and Werner Kowalski, Weilerswist-Metternich, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 6, 1983, Ser. No. 558,777

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246727; Mar. 22, 1983, 3310272

Int. Cl.³ C01B *25/30*

U.S. Cl. 423—315 **9 Claims**



1. In a process for making alkali metal polyphosphates from alkali metal phosphate solutions and suspensions, respectively, by forcing the feed materials through at least one nozzle and spraying said feed materials inside a spray tower through a flame zone produced by a plurality of burners arranged in annular fashion, the improvement which comprises additionally introducing dusty material separated from the gas issuing from the spray tower into the spray tower from above and regularly distributing said dusty material across the spray region of the at least one nozzle and thereby effecting the formation of agglomerated alkali metal polyphosphates.

4,534,947

PROCESS FOR DIRECT SYNTHESIS OF SODIUM- AND POTASSIUM-CONTAINING ZEOLITE A

David E. W. Vaughan, Flemington, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 4, 1984, Ser. No. 606,939

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 **6 Claims**

1. A process for directly preparing a Type 3A zeolite containing sodium and potassium ions comprising the steps of:

(a) preparing a reaction mixture comprising sodium silicate, potassium silicate, water, a source of alumina, and adding a seed source, said seed source comprising Type A zeolites, and the reaction mixture having a composition, expressed in mole ratios of oxides, within the ranges:

$(Na_2O+K_2O):Al_2O_3$—1.4 to 2.1
$SiO_2:Al_2O_3$—1.8 to 2.5
$H_2O:Al_2O_3$—40 to 100
$Na_2O:Al_2O_3$—0.3 to 1.0
$K_2O:Al_2O_3$—1.3 to 1.7

(b) maintaining the reaction mixture at a temperature of between about 60° and 120° C. for a time sufficient to form a substantially pure crystalline zeolite 3A product, and

(c) recovering a substantially pure Type 3A zeolite from the reaction mixture.

4,534,948

METHOD FOR PREPARING SILICON CARBIDE

Ronald H. Baney, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 135,567, Mar. 31, 1980, Pat. No. 4,310,651, which is a continuation-in-part of Ser. No. 24,137, Mar. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 910,247, May 30, 1978, abandoned. This application Jun. 29, 1981, Ser. No. 278,292

Int. Cl.[3] C01B *31/36*

U.S. Cl. 423—345 1 Claim

1. An improved method of preparing silicon carbide which consists of

(A) treating organohalogendisilanes with 0.1 to 10 percent by weight of a catalyst selected from the group consisting of quaternary ammonium halides having the formula $(R')_4NX$, quaternary phosphonium halides having the formula $(R')_4PX$ and hexamethylphosphoramide wherein R' is a member selected from the class consisting of alkyl and aryl radicals and X is a halogen, at a temperature of from 150° C. to 340° C. for a period of 1 to 48 hours while distilling by-produced volatile materials until there is produced a polysilane, which is a solid at 25° C., having the average formula

$$\{(CH_3)_2Si\}\{CH_3Si\}$$

in which polysilane there is from 0 to 60 mole percent $(CH_3)_2Si$=units and 40 to 100 mole percent CH_3Si=units, wherein the remaining bonds on the silicon are attached to either another silicon atom, a chlorine atom or a bromine atom such that the polysilane contains from 10–38 weight percent, based on the weight of the polysilane, of hydrolyzable chlorine or 21–58 weight percent based on the weight of the polysilane of hydrolyzable bromine,

(B) forming a shape from said polysilane,

(C) heating the shape in an inert atmosphere or in a vacuum to an elevated temperature in the range of 1150° C. to 1600° C. until said polysilane is converted to silicon carbide.

4,534,949

PROCESS FOR THE MANUFACTURE OF MOLDED CARBON BODIES

Herbert Glaser, Gladbeck, and Konrad Stolzenberg, Waltrop, both of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 388,006, Jun. 14, 1982, abandoned. This application Jun. 29, 1984, Ser. No. 626,091

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125609

Int. Cl.[3] C01B *31/02*

U.S. Cl. 423—445 11 Claims

1. A process for the manufacture of an anisotropic molded carbon body having a diameter (d) from high-boiling aromatic hydrocarbon fractions derived from coal or mineral oil and having a high coking residue, without an additional binding agent and without using high pressures, comprising

filling a mold in the shape of the desired molded carbon body having a diameter of at least 0.1 m with at least one hydrocarbon fraction having a softening point in excess of 40° C. (Krämer Sarnow), said hydrocarbon fraction being in the liquid state or solid state,

and heating said fraction without pressure up to 550° C., in a first heating stage until said hydrocarbon is completely converted from the liquid into the solidified stage whereby the crystal structure is oriented by the shear forces of the rising gas bubbles and a needle-like structure is built up,

heating in a second heating stage up to approximately 800° C., at a linear heating rate of approximately

$$1.2\times(1/d^2)°K./day$$

which is a function of the diameter d in meters of the molded body,

and burning the molded body at a temperature of not less than 850° C.,

removing said body from the mold and graphitizing said molded body.

4,534,950

PROCESS FOR PRODUCING CARBON FIBERS

Seiichi Uemura, Tokyo; Takao Hirose, Kamakura, and Yoshio Sohda, Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1983, Ser. No. 520,157

Claims priority, application Japan, Aug. 13, 1982, 57-139796

Int. Cl.[3] D01F *9/12*

U.S. Cl. 423—447.4 8 Claims

1. A process for producing carbon fibers, which consist of melt spinning a carbonaceous pitch to obtain pitch fibers, contacting the thus obtained pitch fibers with hydrobromic acid, making the thus contacted fibers infusible in an oxidizing atmosphere and then carbonizing or graphitizing the thus treated pitch fibers to obtain the carbon fibers.

4,534,951

MANUFACTURE OF HIGH QUALITY GRAPHITE ELECTRODES USING CALCINED ANTHRACITE COAL AS RAW MATERIAL

James W. Kortovich, Strongsville, and Eugene Micinski, Parma, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 322,238, Nov. 17, 1981, abandoned, which is a continuation of Ser. No. 133,751, Mar. 25, 1980, abandoned. This application Nov. 17, 1983, Ser. No. 552,734

Int. Cl.[3] C01B *31/04*

U.S. Cl. 423—448 3 Claims

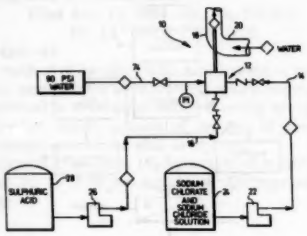
1. In the manufacture of high quality graphite electrodes for use in electric arc furnaces wherein a mixture containing premium petroleum coke particles and a pitch binder is shaped to the form of the desired electrode, baked at carbonizing temperatures and then graphitized, the improvement comprising mixing together premium petroleum coke particles and particles of calcined anthracite coal as a filler material in a manner such as to form a substantially uniform mixture thereof, the amount of coal particles in said mixture constituuting from about 10 to 20% by weight of the total filler material, the coal particles having a particle size ranging from about 3 to about 10 mesh.

2. A shaped graphite electrode for use in an electric arc furnace composed of an all-graphitized, particulate, pitch-bonded petroleum coke matrix in which particles of calcined anthracite coal are substantially uniformly distributed, said electrode being formed from a mixture containing premium petroleum coke particles and calcined anthracite coal particles as the filler material and a carbonaceous pitch binder, the coal particles constituting from about 10 to 20% by weight of the total filler material and having a particle size ranging from about 3 to about 10 mesh and being further characterized by having the following properties measured with-grain: a coefficient of thermal expansion of less than about 0.6×10^{-6}/°C., a resistivity of less than about 8.0 micro ohm meters and a flexural strength of at least about 900 pounds per square inch.

4,534,952
SMALL SCALE GENERATION OF CHLORINE DIOXIDE FOR WATER TREATMENT

W. Howard Rapson, Toronto, and Maurice C. J. Fredette, Mississauga, both of Canada, assignors to ERCO Industries Limited, Islington, Canada

Filed Feb. 24, 1984, Ser. No. 583,438
Int. Cl.³ C01B *11/02*
U.S. Cl. 423—478 **11 Claims**



1. A process for the production of an aqueous solution of chlorine dioxide, which comprises:

(a) feeding to a reaction zone filled with aqueous reaction medium chlorine dioxide-producing reactants, in the form of (i) an aqueous solution of sodium chlorate and sodium chloride having individual concentrations of from about 1 to about 2.5M in molar proportions of sodium chlorate to sodium chloride of about 0.9:1 to about 0.95:1 and (ii) sulphuric acid having a total acid normality of about 20 to about 36 normal, at flow rates to provide said reaction medium with concentrations of sodium chlorate and sodium chloride of about 0.5 to about 1.2 molar each and a total acid normality of about 8 to about 16 normal;

(b) subjecting said aqueous reaction medium in said reaction zone to a pressure in the range of about 60 to about 90 psig to maintain potentially gaseous products of reaction, including chlorine dioxide, substantially dissolved in said aqueous reaction medium,

(c) retaining said reaction medium in said reaction zone for at least about 12 seconds at a temperature of about 30° to about 50° C., and

(d) discharging the resulting aqueous solution of chlorine dioxide in spent reaction medium from said reaction zone to a recipient aqueous medium to be dissolved therein without the chlorine dioxide assuming a gaseous form.

4,534,953
PROCESS FOR PREPARING SOLID TITANIUM TRICHLORIDE USEFUL FOR THE POLYMERIZATION OF AN α-OLEFIN

Nobuaki Goko, and Yumito Uehara, both of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Jun. 29, 1983, Ser. No. 508,906
Claims priority, application Japan, Jul. 13, 1982, 57-121745; Jul. 15, 1982, 57-123698
Int. Cl.³ C01G *23/02*
U.S. Cl. 423—492 **12 Claims**

1. A process for preparing solid titanium trichloride which is useful for the polymerization of an α-olefin, which comprises:

(a) precipitating violet-colored, fine, solid particles of titanium trichloride from a liquid medium containing titanium trichloride liquefied in the presence of an ether at a temperature of no more than 150° C. under the condition that after at least 80%, based on the total amount of titanium trichloride in the system, of the violet-colored, fine, solid particles of titanium trichloride have precipitated, titanium tetrachloride is added to said liquid medium in an amount such that the molar ratio of titanium tetrachloride to the total amount of titanium trichloride in the system ranges from 0.2 to 10; and

(b) aging the precipitated particles at a temperature of from 60° to 120° C.

5. The process of claim 1, wherein said aging step (b) is conducted at a temperature of from 80° to 100° C.

4,534,954
SODIUM HYDROSULFITE SLURRIES

Edwin D. Little, and Karsten R. Minzghor, both of Portsmouth, Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Continuation of Ser. No. 408,786, Aug. 17, 1982, abandoned. This application Mar. 8, 1984, Ser. No. 585,640
Int. Cl.³ C01B *17/66*; D06L *3/10*
U.S. Cl. 423—515 **2 Claims**

2. A method for making a storable and pumpable aqueous dithionite slurry from crystalline dithionite which comprises, on a weight basis:

(A) preparing a dilute hydrosol containing about 0.13–0.25% by weight of Xanthan gum;

(B) sequentially adding aqueous solutions of a chelate and sodium hydroxide or potassium hydroxide to the dilute hydrosol, while stirring said dilute hydrosol to form an alkaline hydrosol;

(C) cooling said alkaline hydrosol to 32° F. (0°) in an ice bath to form a cold hydrosol;

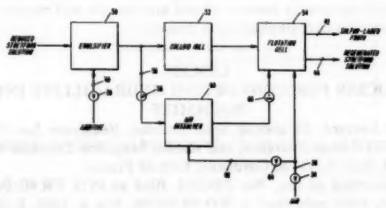
(D) adding sodium dithionite to said cold hydrosol at such a rate as to maintain its temperature below 7° C. and in sufficient amount to provide said dithionite slurry containing at least about 25% of pure sodium dithionite and having a pH of at least 10; and

(E) recovering a storable and pumpable tripolyphosphate-free aqueous sodium dithionite slurry.

4,534,955
SULFUR EXTRACTION PROCESS

John M. Rosenbaum, Albany, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 1, 1983, Ser. No. 510,379
Int. Cl.³ C01B *17/05*
U.S. Cl. 423—573 R **5 Claims**



1. A method of extracting sulfur from gas containing hydrogen sulfide comprising the steps of:

contacting the gas with a liquid Stretford solution which reacts with the hydrogen sulfide to produce elemental sulfur;

separating the liquid solution containing suspended elemental sulfur from the gas;

adding a non-polar hydrocarbon to the Stretford liquid;

emulsifying the non-polar hydrocarbon and the Stretford liquid solution;

enhancing particle-bubble attachment properties of the liquid solution by agglomerating the suspended elemental sulfur by flowing the emulsified liquid Stretford solution through a colloid mill;

passing air through the liquid solution to regenerate that solution and float suspended sulfur to the top of that solution; and

removing the floated sulfur from the solution.

4,534,956

MOLTEN SALT SYNTHESIS OF BARIUM AND/OR STRONTIUM TITANATE POWDER

Ronald H. Arendt, Schenectady, and Wayne D. Pasco, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 512,082, Jul. 8, 1983, abandoned, which is a continuation of Ser. No. 394,356, Jul. 1, 1982, abandoned. This application Mar. 15, 1984, Ser. No. 589,911

The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.

Int. Cl.³ C01G *23/00*

U.S. Cl. 423—598 **4 Claims**

1. A process for producing alkaline earth titanate powder having an average crystal size ranging from about 0.3 micron to about 2 microns which consists essentially of providing particulate TiO_2 in stoichiometric amount, providing particulate alkaline earth carbonate in an amount ranging from about 2% by weight to about 10% by weight in excess of stoichiometric amount, said alkaline earth carbonate being selected from the group consisting of $BaCO_3$, $SrCO_3$ and mixtures thereof, providing an alkali carbonate salt selected from the group consisting of sodium carbonate, potassium carbonate, lithium carbonate and mixtures thereof, forming a mixture of said TiO_2, said alkaline earth carbonate and said carbonate salt, said alkali carbonate salt being used in an amount from about 20% by weight to about 70% by weight of the total amount of said TiO_2, said alkaline earth carbonate and said carbonate salt, heating said mixture to a reaction temperature at least sufficient to melt said carbonate salt and ranging from about 873 K. to about 1473 K., each said alkaline earth carbonate being decomposible at said reaction temperature to form the oxide and by-product gas, said carbonate salt in molten form being a solvent for said TiO_2 and alkaline earth carbonate, maintaining said reaction temperature, continually dissolving and reacting said added TiO_2 and alkaline earth carbonate in said molten salt producing by-product gas and precipitating said alkaline earth titanate at said reaction temperature, at said reaction temperature said TiO_2 and said alkaline earth carbonate being slightly soluble in said molten salt to maintain a reactant-saturated solution, said average crystal size of said alkaline earth titanate powder increasing with increasing reaction temperature and/or with increasing amount of said molten salt, and recovering said precipitated alkaline earth titanate.

4,534,957

PROCESS FOR CONVERTING HYDRAGILLITE INTO BOEHMITE

Alain Lectard, 22 avenue Saint Jerome, Residence Les Pins, 13100 Aix-en-Provence, and Robert Magrone, Quartier Mistral, Villa I, 13120 Gardanne, both of France

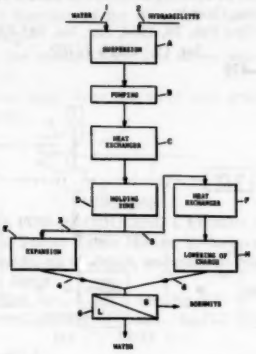
Continuation of Ser. No. 219,302, filed as PCT FR 80/00030 Feb. 6, 1980, published as WO 80/01799, Sep. 4, 1980, § 102(e) date Sep. 9, 1980, abandoned. This application May 9, 1983, Ser. No. 492,564

Claims priority, application France, Feb. 28, 1979, 79 05688

Int. Cl.³ C01F *7/02*

U.S. Cl. 423—625 **10 Claims**

1. A continuous process for the production of boehmite of controlled grain size by dehydration of hydrargillite, wherein the grain size of the boehmite produced is less than or equal to the grain size of the hydrargillite and the concentration of alkaline impurities in the boehmite produced is less than the concentration of alkaline impurities in the hydrargillite, comprising mixing hydrargillite with water to form a suspension containing 150 to 700 g/l of dry material expressed as Al_2O_3, passing the suspension under pressure through a reaction zone, heating the suspension in a heating zone of the reaction zone to a reaction temperature within the range of 200°–270° C. at a speed of temperature rise of 1° C./minute, and thereafter maintaining the suspension in a holding zone of the reaction zone for a period of from 1 minute to 60 minutes at a temperature in the said range for reaction to convert hydrargillite to boehmite, reducing the pressure of the suspension issuing from the reaction zone to atmospheric pressure with cooling whereby



the resulting suspension comprises a solid phase of boehmite within a liquid phase, and then separating the boehmite as a solid phase from the liquid phase.

4,534,958

AEROSOL GEL

Dennis V. Adams, Grosse Pointe Farms; Norbert J. Cremers, Grosse Pointe, and Raymond L. Henry, Grosse Pointe Woods, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jul. 13, 1983, Ser. No. 513,439

Int. Cl.³ A61K *9/00*

U.S. Cl. 424—45 **6 Claims**

1. A pressurized composition in an aerosol container capable of forming a spray upon release of pressure therefrom which composition is a liquid inside the container and forms a gel on contact with living tissue comprising by weight about 35 to 80 percent water, 3 to 50 percent propellant, 1 to 10 percent volatile solvent and 10 to 25 percent of a polyoxyethylene-polyoxypropylene copolymer of the formula:

$$HO(C_3H_4O)_m(C_3H_6O)_n(C_2H_4O)_mH$$

wherein n is an integer; the value of which is such that the molecular weight of the oxypropylene groups is from about 2250 to 4000; and the value of m is such that the oxyethylene groups constitute about 50 to 90 percent by weight of the compound.

4,534,959

AEROSOL GEL

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 22, 1983, Ser. No. 524,985

Int. Cl.³ A61K *9/00*

U.S. Cl. 424—45 **10 Claims**

1. A pressurized composition in an aerosol container capable of forming a spray upon release of pressure therefrom which composition is a liquid inside the container and forms a gel on contact with living tissue comprising by weight about 45 to 90 percent water, 3 to 50 percent propellant and 7 to 20 percent of a polyoxyethylene-polyoxypropylene copolymer of the formula:

$$Y[(C_3H_6O)_n(C_2H_4O)_mH]_x$$

wherein Y is the residue of a water-soluble organic compound containing therein x active hydrogen atoms; n is an integer; x is an integer greater than 1; the value of n and x are such that the

molecular weight of the oxypropylene groups is from about 3250 to 7500; and the value of m is such that the oxyethylene groups constitute about 45 to 90 percent by weight of the total compound and wherein the water/copolymer weight ratio is at least about 4.5:1.

4,534,960

MENTHOLATED ORAL COMPOSITION

Leonard Chavkin, Westfield, N.J., assignor to Warren Glen Products, Inc., Bloomsbury, N.J.

Filed Apr. 12, 1984, Ser. No. 599,641
Int. Cl.³ A61K *7/16, 7/26*
U.S. Cl. 424—49 **3 Claims**

1. In a method of gargling with mouth wash or mouth sprays containing menthol, the improvement which comprises raising the concentration of menthol which is orally acceptable without discomfort which consists of the step of contacting the mucous membranes of the oral cavity with

from about 0.25 to about 1% by weight of menthol and from about 10 to 50% by weight of hydrogenated glucose syrup.

4,534,961

WAX BASE MAKEUP COMPOSITION

Lawrence J. Liff, 6502 N. Central #A-101, Phoenix, Ariz. 85012

Continuation of Ser. No. 909,575, May 25, 1978, abandoned. This application Oct. 19, 1981, Ser. No. 312,934
Int. Cl.³ A61K *7/021, 7/025, 7/031*
U.S. Cl. 424—63 **7 Claims**

1. A solid base formulation for multiple makeup uses including in combination a mixture consisting of on the order of 85 to 92% of amber, microcrystalline wax intimately admixed with on the order of 8 to 15% of petrolatum, said petrolatum having a melting point of 127°–137° F.

4,534,962

SODIUM BICARBONATE SUSPENSION AS DEODORANT PRODUCT

Frank W. Marschner, Whitehouse Station, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 221,093, Dec. 29, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 423,952
Int. Cl.³ A61K *7/32, 47/00*
U.S. Cl. 424—65 **10 Claims**

1. A fast-drying, stable viscous pituitous deodorant suspension comprising about 1–20% alkali metal bicarbonate particles uniformly suspended in a vehicle with substantially no bicarbonate in solution, comprising a high alcohol content of lower aliphatic monohydric alcohol and a low water content and hydroxyethyl cellulose suspending agent in an amount above its alcohol solubility and within the range of about 0.1–1%, said monohydric alcohol content exceeding the upper solubility level for the water soluble hydroxyethyl cellulose in said alcohol and within the range of about 55–75%, and the water content being sufficient to prevent precipitation of said suspending agent and at least 5%, if at least 10% polyhydric alcohol is also present in the suspension, and up to about 25% by weight.

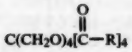
4,534,963

HIGH PEARLESCENT PRESSED POWDER EYE SHADOW COMPOSITION

Philip J. Gordon, Southbury, Conn., assignor to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Jul. 20, 1983, Ser. No. 515,943
Int. Cl.³ A61K *7/035, 7/021, 47/00*
U.S. Cl. 424—69 **25 Claims**

1. A pressed powder cosmetic composition containing a binder and from about 40 to about 80% by weight of nacreous material, said binder comprising a dry binder ingredient consisting of a cosmetically suitable micronized polyethylene wax and a mixture of liquid/solid binder ingredients comprising petrolatum; a cosmetically suitable tetraester having the formula



wherein R may be a straight, branched, saturated or unsaturated alkyl having from 5 to 21 carbon atoms; and a cosmetically suitable polyolefin formed by polymerizing an alphaolefin having the formula $RCH{=}CH_2$, wherein R is a hydrocarbon group having from 3 to 18 carbon atoms.

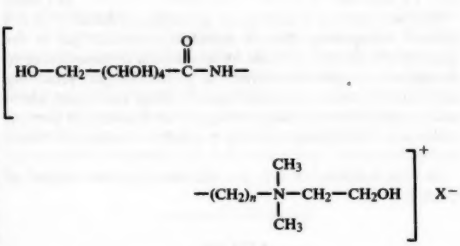
4,534,964

HAIR CONDITIONING SHAMPOO

Morris S. Herstein, Nanuet, N.Y.; Walter P. Smith, Sandy Hook, and Geoffrey R. Hawkins, Branford, both of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 433,565, Oct. 4, 1982, abandoned. This application Jan. 12, 1984, Ser. No. 569,528
Int. Cl.³ A61K *7/06, 31/16;* **C11D** *1/94*
U.S. Cl. 424—70 **6 Claims**

1. An aqueous hair conditioning shampoo composition containing, percentages given being by weight based upon the total weight of the composition, from about 0.5 percent to about 10 percent of cocamidopropyl hydroxysultaine and from about 0.1 to about 6 percent of a quaternary halide of an N,N,N-trialkylaminoalkylene gluconamide having the formula:



wherein X is chloro or bromo and n is an integer of from 2 to 4.

4,534,965

CONTROLLING PLANT FUNGI USING STREPTOMYCETES GROWN ON CHITIN

Lewis R. Brown, Starkville, and Susan Brown-Skrobot, Mississippi State, both of Miss., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 26, 1983, Ser. No. 536,025
Int. Cl.³ A01N *63/00;* **C12P** *1/00;* **C12N** *15/00, 1/20;* **C12R** *1/465;* **A01C** *1/06;* **A01B** *79/00*
U.S. Cl. 424—93 **8 Claims**

1. A biologically pure culture of species No. 1 which has been deposited under ATCC 39434.

4,534,966

COMPOSITION FOR TREATING INFECTIOUS DISEASES, GOUT OR ARTERIOSCLEROSIS CONTAINING HUMAN PEPSIN AND/OR HUMAN LEUKOCYTE PEPSIN-LIKE ENZYME AND METHOD FOR USING SAME

Haruo Ohnishi, Funabashi; Hiroshi Kosuzume, Yokohama; Yasuo Suzuki, Kawaguchi, and Ei Mochida, Tokyo, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,613
Claims priority, application Japan, Nov. 20, 1982, 57-203990
Int. Cl.³ A61K *37/54*
U.S. Cl. 424—94 **15 Claims**

1. A pharmaceutical composition having an effect to control phagocytic function, which comprises a phagocytic function controlling effective amount of a human leukocyte pepsin-like enzyme having a molecular weight of 35,000–41,000, an isoelectric point of 2.5–3.5, a maximum absorption of 278 nm, giving a positive ninhydrin reaction and being readily soluble in water and insoluble in ether and chloroform, and a pharmaceutically acceptable carrier.

7. A method for treating infectious diseases, gout or arteriosclerosis, which comprises administering a therapeutically effective amount of human pepsin and/or a human leukocyte pepsin-like enzyme to a patient suffering from an infectious disease, gout or arteriosclerosis.

4,534,967

CELL PROLIFERATION INHIBITOR AND METHOD OF PREPARATION

Bernard Jacobson, Lexington, and Laurie Raymond, Cambridge, both of Mass., assignors to Boston Biomedical Research Institute, Boston, Mass.

Filed Aug. 3, 1982, Ser. No. 404,656
Int. Cl.³ A61K *35/44*
U.S. Cl. 424—95 **14 Claims**

1. A non-extractive method for preparing an inhibitor of cell growth, comprising directly liquefying vitreous gel in the absence of extraction solvent by application of shear forces to the gel so as to directly convert the gel into a liquid, removing any insoluble and suspended material from the liquid, chromatographically separating the liquid into fractions of varying molecular weight and isolating a product having inhibitory activity.

12. The inhibitor of cell growth made by the method of claim 1.

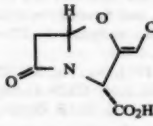
4,534,968

PHARMACEUTICAL COMPOSITIONS

John P. Clayton, Horsham, England, assignor to Beecham Group Limited, England

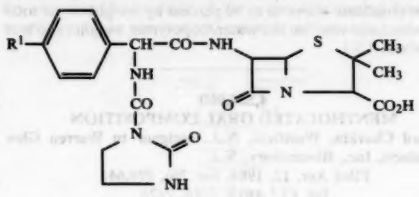
Continuation of Ser. No. 887,843, Mar. 17, 1978, abandoned, which is a continuation of Ser. No. 804,998, Jun. 9, 1977, abandoned. This application Jun. 26, 1980, Ser. No. 163,230
Claims priority, application United Kingdom, Jun. 26, 1976, 26689/76
Int. Cl.³ A61K *35/00*
U.S. Cl. 424—114 **33 Claims**

1. An antibacterial mixture comprising a synergistically effective amount of the compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof and an antibacterially effective amount of a compound of the formula (III):



(III)

or a pharmaceutically acceptable salt thereof wherein R^1 is hydrogen or hydroxyl, in a weight ratio of from 1:1 to 1:15.

4,534,969

METHOD FOR IMPROVING LACTATION IN RUMINANT ANIMALS

Dorothy J. Phillips, Natick, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 19, 1983, Ser. No. 533,824
Int. Cl.³ A61K *35/00*
U.S. Cl. 424—118 **6 Claims**

1. A method for improving lactation in lactating ruminant animals which comprises administering to said animals an effective amount of Teichomycin A_2 or its physiologically acceptable salts, esters and amides.

4,534,970

ANTIBACTERIAL ANTIBIOTICS LL-CO8078α_1, α_2, α_3 AND β

David P. Labeda, Monsey; Joseph J. Goodman, Spring Valley; Donald B. Borders, Suffern, all of N.Y.; Raymond T. Testa, Cedar Grove, N.J., and John H. E. J. Martin, deceased, late of New City, N.Y. (by Mary B. Martin, executrix), assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 23, 1983, Ser. No. 507,184
Int. Cl.³ A61K *35/74;* C12P *1/06*
U.S. Cl. 424—122 **8 Claims**

1. Antibacterial antibiotic LL-CO8078α_1, a composition which is effective in inhibiting the growth of bacteria and in its substantially pure form has:

(a) the following elemental analysis (percent): C, 65.95; H, 8.06; N, 3.21; O, 23.16;

(b)

optical rotations $[\alpha]_D^{26}$ = −44° ± 2 (0.496% in chloroform);
= −89° ± 1 (0.790% in methanol);

(c) characteristic ultraviolet absorption spectra as shown in FIG. I of the attached drawings;

(d) a characterstic infrared absorption spectrum as shown in FIG. II of the attached drawings;

(e) a characteristic ^{13}C-nuclear magnetic resonance spectrum as shown in FIG. III of the attached drawings;

(f) a characteristic proton nuclear magnetic resonance spectrum as shown in FIG. IV of the attached drawings; and

(g) a molecular weight by mass spectroscopy of 778.

4,534,971

COMPLEXATION OF ANTHRACYCLINE AND ANTHRAQUINONE ANTIBIOTICS BY THE APO RIBOFLAVIN BINDING PROTEIN FROM EGGS

Jed F. Fisher, Minneapolis, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

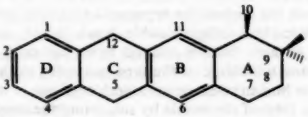
Filed Oct. 20, 1982, Ser. No. 435,616

Int. Cl.[3] C12N *11/02*; A01N *31/00*; C07C *103/52*; C07G *7/00*; A23J *1/00*; C12P *19/56*

U.S. Cl. 514—21 15 Claims

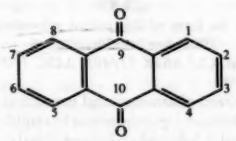
1. A method for the preparation of stable complexes of antitumor antibiotics of the anthracycline and anthraquinone classes with purified apo riboflavin binding protein from eggs which comprises:

(A) preparing a water miscible solution of an antibiotic of the class consisting of (1) anthracyclines having the formula:



wherein positions 4, 5, 6, 7, 9, 10, 11 or 12 may be substituted, positions 5 and 12 have =O or OH, positions 4, 6 and 11 may have H, OH or OCH_3 when positions 5 and 12 have =O, positions 6 and 11 have =O when positions 5 and 12 have OH, position 7 may have 7S or 7R chirality due to OCH_3 or any mono-, di- or trisaccharide substituent, position 9 may have 9S or 9R chirality due to OH and either CH_3, CH_2CH_3, $COCH_2OH$ or $COCH_2OR$ where R is an ether or ester functional group, and position 10 may have 10S or 10R chirality due to CO_2CH_3, $CO_2CH_2CH_3$ or CO_2H,

and (2) anthraquinones having the formula:



wherein positions 1, 4, 5 and 8 may be substituted, positions 1 and 4 having H or OH and positions 5 and 8 may have $N(CH_2)_2NH_2^+(CH_2)_2OH$, or any bis[(hydroxyalkyl-)amino]alkyl side chain,

(B) preparing an aqueous solution of purified apo riboflavin binding protein from eggs, and

(C) admixing the solutions in substantially equimolar proportions of antibiotic to protein to form a complex.

4,534,972

PROTEIN COMPOSITIONS SUBSTANTIALLY FREE FROM INFECTIOUS AGENTS

Kenneth J. Lembach, Danville, Calif., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 29, 1983, Ser. No. 480,056

Int. Cl.[3] A61K *39/12, 39/02, 37/00, 39/00, 39/42, 39/40*

U.S. Cl. 424—86 18 Claims

1. A method for rending a composition, which contains a therapeutically or immunologically active protein, selected from the group consisting of blood plasma proteins, virus vacines, bacterial vaccines, and non-infectious antigens dissolved in an aqueous medium, substantially free from infectious agents selected from viable viruses and bacteria without substantial loss of therapeutic or immunologic activity, which comprises

(a) mixing an aqueous solution of the protein composition with an effective amount of a complex formed from mixing an angularly-fused, polynuclear heterocyclic arene have two nitrogen atoms in a "cis-ortho" relationship and a source of transition metal ions capable of complexing with said arene and a thiol in effective amounts to inactivate substantially all of the infectious agents contained in said composition and which does not result in substantial loss of therapeutic or immunological activity and

(b) holding the mixture for a time and at a temperature sufficient to render said infectious agents substantially non-infective in the protein composition without substantial loss of therapeutic or immunologic activity therein.

4,534,973

PHARMACEUTICAL COMPOSITIONS

Miwon S. Kim, Princeton Junction, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Jul. 31, 1984, Ser. No. 635,962

Int. Cl.[3] A61K *31/27, 31/61*

U.S. Cl. 514—162 4 Claims

1. A therapeutic composition, in unit dosage form, for the systematic treatment and relief of pain, muscle spasm and limited mobility associated with acute painful muscoloskeletal conditions, said composition comprising a mixture of from about 1 to about 2 parts by weight aspirin per part by weight of N-propyl-2-methyl-2-propyl-1,3-propanediol dicarbamate.

4,534,974

PHARMACEUTICAL COMPOSITIONS WITH CODEINE

Miwon S. Kim, Princeton Junction, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Jul. 31, 1984, Ser. No. 636,192

Int. Cl.[3] A61K *31/27, 31/61, 31/485*

U.S. Cl. 514—161 4 Claims

1. A therapeutic composition, in unit dosage form, for the systematic treatment and relief of pain, muscle spasm and limited mobility associated with acute painful muscoloskeletal conditions, said composition comprising a mixture of from about 15 to about 20 parts by weight aspirin, from about 10 to about 15 parts by weight of N-propyl-2-methyl-2-propyl-1, 3-propanediol dicarbamate, and from about 1 to about 2 parts by weight codeine phosphate.

4,534,975

PHARMACEUTICAL COMPOSITION CONTAINING 24,25-DIHYDROXYCHOLECALCIFEROL IN METHODS OF TREATMENT

Hideyuki Yamato, Tokyo; Yuji Maeda, Nagareyama; Fumisato Yoshino; Kyoya Takahata, both of Tokyo; Masanori Ikuzawa, Tachikawa; Tadaaki Kato, Tokyo, and Chikao Yoshikumi, Kunitachi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 620,923, Jun. 15, 1984, Pat. No. 4,501,738. This application Oct. 1, 1984, Ser. No. 656,760

Claims priority, application Japan, Jun. 30, 1983, 58-119423; Jun. 30, 1983, 58-119424; Jun. 30, 1983, 58-119425; Jun. 30, 1983, 58-119426; Jun. 30, 1983, 58-119428

Int. Cl.[3] A61V *31/59*

U.S. Cl. 514—730 2 Claims

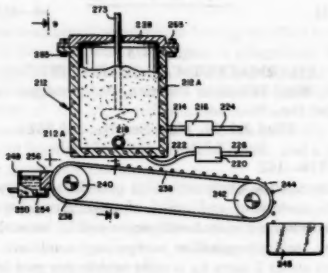
1. A method for the treatment of hypertension, hypotension, hyperlipemia, or diseases due to the functional accentuation of thrombocytes, which comprises administering to a patient suffering from hypertension, hypotension, hyperlipemia, or diseases due to the functional accentuation of thrombocytes an effective amount of a compound of 24,25-dihydroxycholecalciferol.

4,534,976

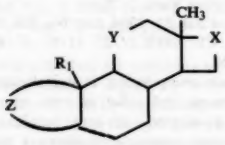
METHOD AND MEANS FOR REPELLING ANIMALS

Helge Hansen; Borje Nystrom, both of Stavanger, and Eyvin Torneng, Hinna, all of Norway, assignors to International Flavors & Fragrances Inc., New York, N.Y.

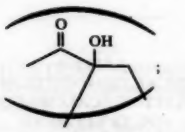
Continuation-in-part of Ser. No. 474,588, Feb. 23, 1983, Pat. No. 4,451,460. This application Aug. 1, 1983, Ser. No. 519,182
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.[3] A61K *31/56*
U.S. Cl. 514—169 15 Claims

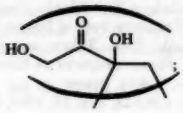


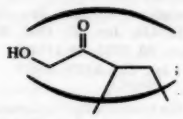
1. A method for repelling non-predatory animals by placing smelling repellent substances in the area from which the animals are to be kept off characterized by the use as a repellent substance of one or more steroids defined according to the structure:

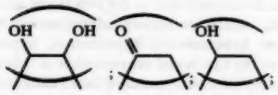


wherein X completes a substituted cyclopentyl moiety and is one of the moieties:









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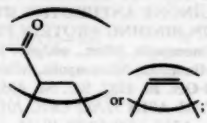


wherein Y represents methylene, carbinol or keto; and wherein Z completes a substituted cyclohexyl moiety which is, in the alternative:

hydroxycyclohexyl;
ketocyclohexyl;
ketocyclohexenyl;
hydroxyphenyl;
cyclohexenyl; or
bicyclohexyl

and wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond, which steroids are synthetic or have been extracted from naturally occurring materials and which are of the type occurring on human skin or hair or in human sweat or urine and/or of one or more of the derivatives thereof obtainable by subjecting the steroids to air, moisture or microorganisms in such a manner as to provide in the air a concentration perceptible to the sense of smell of the non-predatory animals.

4,534,977

COMPOSITION OF MATTER COMPRISING A LOW BULK DENSITY LYOPHILIZED PREPARATION OF SODIUM PIPERACILLIN

Bruce E. Haeger, Highland Mills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 379,378, May 17, 1982, Pat. No. 4,477,452, which is a continuation-in-part of Ser. No. 247,586, Mar. 26, 1981, abandoned. This application Jul. 11, 1984, Ser. No. 629,859
The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.
Int. Cl.[3] A61K *31/495;* A23C *1/06*
U.S. Cl. 514—196 2 Claims

1. In a lyophilized pharmaceutical parenteral dosage unit of 6-[2-(4-ethyl-2,3-dioxo-1-piperazinecarboxamido)-2-phenylacetamido]-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid sodium salt, the improvement which comprises a low bulk density cake of sodium piperacillin having a volume of from about 7 cc/gm to about 9 cc/gm, and having the capacity to be reconstituted to a concentration of about 400 mg/ml in less than 1 minute 30 seconds.

4,534,978

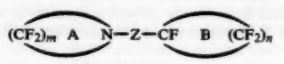
PERFLUOROCYCLOAMINES

Kazumasa Yokoyama, Toyonaka; Chikara Fukaya, Osaka; Yoshio Tsuda, Takarazuka; Taizo Ono, Osaka; Yoshio Arakawa, Suita, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Division of Ser. No. 454,107, Dec. 28, 1982, abandoned. This application Jul. 24, 1984, Ser. No. 633,085
Int. Cl.[3] C07D *265/32*
U.S. Cl. 514—429 3 Claims

1. An emulsion containing a perfluorocycloamine compound capable of carrying oxygen, said emulsion comprising:

5–50% (w/v) of a perfluorocycloamine compound of the formula:



wherein
either or both of ring A and ring B may be substituted with lower perfluoroalkyl groups,
m and n are independently 4, 5 or 6, and
Z is a perfluoroalkylene group or a chemical bond, with the proviso that n is 4 or 6 when n is 4 and Z is a chemical bond,
as an oxygen carrying component;
1-5% (w/v) of an emulsifying agent, and
a physiologically acceptable aqueous solution as the balance, the emulsion having a particle diameter of 0.3μ or less.

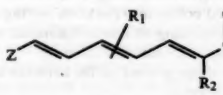
4,534,979

POLYENE COMPOUNDS USEFUL IN THE TREATMENT OF PSORIASIS AND ALLERGIC RESPONSES

Bernard Loev, Scarsdale; Wan-Kit Chan, Yorktown Heights, both of N.Y., and Howard Jones, Holmdel, N.J., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

Continuation-in-part of Ser. No. 511,822, Jul. 8, 1983, which is a continuation-in-part of Ser. No. 392,837, Jun. 28, 1982, Pat. No. 4,472,430. This application Nov. 2, 1984, Ser. No. 667,703
Int. Cl.³ A61K *31/18, 31/19, 31/23*
U.S. Cl. 514—529 **2 Claims**

1. A therapeutic composition for the treatment of inflammatory conditions and allergic responses in a human host, in combination with at least one pharmaceutically-acceptable extender, a therapeutically effective amount of a compound of the general formula



or a pharmaceutically acceptable salt thereof in which
R_1 is hydrogen or an alkyl group of from 1 to 5 carbon atoms;
R_2 is hydrogen or an alkyl group of from 1 to 5 carbon atoms;
R_3 is hydroxyl, alkoxy of from 1 to 5 carbon atoms, NH_2,NHR_2 or HR_2R_2; and
Z is a cycloalkyl, cycloalkenyl or cycloalkdienyl group substituted with from 0 to 5 alkyl groups, a keto group or a hydroxyl group or a phenyl group substituted with from 0 to 4 hydroxy, alkoxy, alkyl or trifluoromethyl groups or halogen atoms or combinations thereof, wherein said pharmaceutically-acceptable extender is in the form of tablets, capsules or solutions for oral administration; solutions for parenteral administration; dusting powders, aerosol sprays, ointments, creams and lotions for topical administration.

4,534,980

ANTIINFLAMMATORY AND ANTIPYRETIC CREAM

Yasuo Itoh, Katsuyamashi; Hideo Kato, Fukuichi; Kugako Matsumura, Katsuyamashi; Tomoyasu Nishikawa, Oonoshi; Akira Hisano, Katsuyamashi; Takehisa Yamada, Katsuyamashi, and Eiichi Koshinaka, Katsuyamashi, all of Japan, assignors to Hokuriku Pharmaceutical Co., Ltd., Katsuyamashi, Japan

Filed Jul. 23, 1984, Ser. No. 633,139
Claims priority, application Japan, Apr. 3, 1984, 59-066228
Int. Cl.³ A61K *31/19*
U.S. Cl. 514—570 **2 Claims**

1. An antiinflammatory and antipyretic cream comprising ketoprofen and crotamiton as an agent for preventing crystalline precipitation,
crotamiton being in a ratio of 0.4 to 1.0 part by weight per 1.0 part by weight of ketoprofen; and;
a pH range of said cream being adjusted to 6.5 to 7.5.

4,534,981

COSMETIC COMPOSITIONS CONTAINING THE FAT OF *SHOREA ROBUSTA*

Arlette Zabotto, Paris, and Jacqueline Grist, Ablon, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed Nov. 8, 1982, Ser. No. 439,984
Claims priority, application Luxembourg, Nov. 17, 1981, 83765
Int. Cl.³ A61K *47/00, 7/025, 7/06*
U.S. Cl. 514—783 **6 Claims**

6. A cosmetic composition in the form of an emulsion for application to the skin comprising 4 to 60 weight percent oil phase, 30 to 90 weight percent water phase and 1 to 20 weight percent emulsifying agent, said oil phase comprising 2 to 20 weight percent of the fat of *Shorea robusta* based on the total weight of said composition, said fat of *Shorea robusta* having the following characteristics:
melting point (°C.)-30 to 38.5,
density (30° C.)-0.860 to 0.900
index of refraction (40° C.)-1.4560 to 1.4580,
index of saponification-180 to 220,
iodine index-36 to 42,
acid index-from 0.1 to 18.9 and
nonsaponifiables (%)-0.73 to 2.2 and at least one substance or material providing for the particular cosmetic desired.

4,534,982

PROCESS FOR PRODUCING CREAM CHEESE TYPE FOOD

Hideaki Yoshida, Sennan, and Hayato Kubota, Izumi, both of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Feb. 22, 1983, Ser. No. 468,280
Claims priority, application Japan, Oct. 27, 1982, 57-189743
Int. Cl.³ A23C *9/12*
U.S. Cl. 426—36 **10 Claims**

1. A process for producing a cream cheese type food, which comprises the steps of:
(a) homogenizing and pasteurizing an aqueous mixture of an aqueous dispersion containing non-fat milk solid, a fat or oil and an emulsifier to prepare a cream mix;
(b) adding a lactic ferment starter and 1 to 50 ppm of rennent to the cream mix to ferment the resulting mixture for 12 to 18 hours;
(c) terminating the lactic fermentation by heating the fermented mixture to 75° to 85° C.;
(d) separating and draining whey from the fermented mixture to obtain a curd;
(e) adding a stabilizer and salt to the curd, heating the resulting mixture to 70° to 85° C. and kneading the mixture with stirring at a rate of 200 to 1,000 r.p.m. in a closed system; and then
(f) homogenizing and cooling the mixture.

4,534,983

PROCESS FOR FLAVORING DRY VEGETABLE MATTER

Casper H. Koene, Hamburg, Fed. Rep. of Germany; Cornelis Vos, and Jan Brasser, both of Huizen, Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands

Filed Jun. 24, 1983, Ser. No. 507,789
Claims priority, application Netherlands, Oct. 14, 1982, 8203963
Int. Cl.³ A23F *3/40;* **A23L** *1/22*
U.S. Cl. 426—293 **26 Claims**

1. A process for preparing a flavored dry vegetable product comprising the steps of mixing pieces of leaf and stem of dry vegetable material selected from the group consisting of tea, herbs and spices with microcapsules of at least one microencapsulated flavor and, simultaneously or subsequently spraying said mixture with an organic solvent selected from the group consisting of ethanol, isopropanol, propylene glycol, glycerol

and benzyl alcohol in an amount of up to about 100 g/kg of flavored product, adding a finely divided aqueous adhesive solution; and continuing the mixing until a free flowing mixture is obtained in which substantially all liquids have been absorbed, wherein the amount of adhesive is sufficient to provide adhesion of the microcapsules to the vegetable material and the amount of solvent is sufficient to prevent the formation of conglomerates of particles of vegetable material or microcapsules.

14. A process for preparing a flavored dry vegetable product comprising the steps of spraying pieces of leaf and stem of dry vegetable material selected from the group consisting of tea, herbs and spices with an organic solvent selected from the group consisting of ethanol, isopropanol, propylene glycol, glycerol and benzyl alcohol in an amount of up to about 100 g/kg of flavored product and then with an aqueous adhesive solution; adding microcapsules of at least one microencapsulated flavor, and mixing until a free flowing mixture is obtained in which substantially all liquids have been absorbed, wherein the amount of adhesive is sufficient to provide adhesion of the microcapsules to the vegetable material and the amount of solvent is sufficient to prevent the formation of conglomerates of particles of vegetable material or microcapsules.

4,534,984

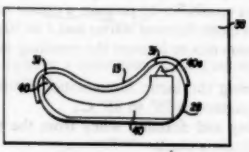
PUNCTURE-RESISTANT BAG AND METHOD FOR VACUUM PACKAGING BONE-IN MEAT

Richard O. Kuehne, Greenville, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Aug. 16, 1983, Ser. No. 523,807

Int. Cl.[3] **B65B** *31/02, 25/00;* **B65D** *33/02*

U.S. Cl. 426—412 **30 Claims**



1. An open ended flexible plastic container adapted to package a meat article having protruding bone sections, comprising;

a plastic bag comprising two sides and a closed end, said sides defining an opening into the interior of said bag opposite said closed end; and

a sheet of a material more puncture resistant than said plastic, one face of said sheet being adhered to one of said sides, said bag being a "lay flat" bag after the sheet of puncture resistant material has been applied thereto; and

wherein the surface area of said face is less than the surface area of the side to which said face is adhered, said sheet being located on and adhered to said bag such that it can be aligned with and overlie the protruding bone sections upon insertion of said meat article into said bag, and said sheet is provided with at least one line of weakness along which a fold can be initiated to cause the puncture resistant material to drape and fold readily over said protruding bone sections when a meat article is placed in said bag said line of weakness being sufficient to allow said sheet to maintain its original alignment with the protruding bone sections of said meat article during vacuum packaging.

4,534,985

CONTINUOUS EXTRACTION PROCESS

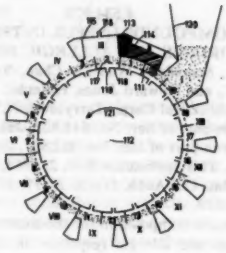
Jacob Gasau, Yverdon, Switzerland, assignor to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 961,716, Nov. 17, 1978, abandoned, which is a continuation of Ser. No. 805,783, Jun. 13, 1977, abandoned. This application Nov. 4, 1980, Ser. No. 203,852

Claims priority, application Switzerland, Jun. 24, 1976, 8065/76

Int. Cl.[3] **A23F** *3/18, 5/26*

U.S. Cl. 426—432 **18 Claims**



1. A process for preparing a coffee extract suitable for use in preparation of beverages comprising the steps of:

(a) grinding roasted coffee into particles having a characteristic diameter according to Rosin, Rammler and Sperling of between about 0.25 mm and 2.0 mm;

(b) forming a bed of the ground coffee between about 0.5 cm and about 15 cm thick;

(c) continuously advancing said bed of ground coffee in a downstream direction past a first extraction station so that the advance of the bed carries said coffee past said first extraction station at a throughput rate of at least about 13 kg/hr; and

(d) forcing a first aqueous liquid extraction medium through said bed at said first extraction station by maintaining a pressure gradient in such medium as said bed advances past such station to form a first extract, the flow rate of such medium through said bed, expressed in kg/hr, being between about 2 times and about 20 times said throughput rate,

each portion of the coffee being extracted while in said bed for a total extraction time of between about 20 seconds and about 5 minutes.

17. A process for preparing a tea extract suitable for use in preparation of beverages comprising the steps of:

(a) forming a bed of particulate tea selected from the group consisting of broken tea leaves, ground tea leaves, tea leaf dust, tea stalk fragments and combinations thereof, the tea particles having dimensions on the order of a few tenths of a millimeter, the bed being between about 0.5 cm and about 15 cm thick;

(b) continuously advancing said bed of tea in a downstream direction past a first extraction station so that the advance of the bed carries the tea past said first extraction station at a throughput rate of at least about 5 kg/hr; and

(c) forcing a first aqueous liquid extraction medium through said bed at said extraction station by maintaining a pressure gradient in such medium as said bed advances past such station to form a first extract, the flow rate of such medium through said bed, expressed in kg/hr, being between about 5 times and about 30 times said throughput rate,

each portion of the tea being extracted while in said bed for a total extraction time of about 1 minute to about 3 minutes.

4,534,986

HIGH-TEMPERATURE TREATMENT OF LIQUIDS

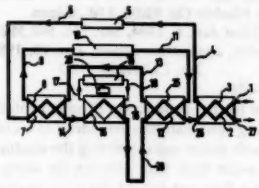
Anthony P. M. Hasting, Crawley, England, assignor to APV International Limited, England

Filed Dec. 7, 1983, Ser. No. 558,968

Claims priority, application United Kingdom, Dec. 8, 1982, 8234987

Int. Cl.³ A23L 3/22

U.S. Cl. 426—521 8 Claims



1. In a method of indirect ultrahigh temperature treatment of a liquid susceptible to thermal damage and having a variable flow rate, in which the liquid must be held at a holding temperature at or above a first holding temperature for a first period of time by which sufficient overall sterilizing effect is obtained with minimal overall thermal damage while flowing at a first flow rate, the improvement comprising determining a higher, second temperature above the first holding temperature and a corresponding higher, second flow rate for the liquid to hold the liquid at that higher temperature for a lesser second period of time to provide sufficient overall sterilizing effect with minimal overall thermal damage, varying the flow rate of the liquid between the first flow rate and the second flow rate, and varying the holding temperature of the liquid between the first holding temperature and the second temperature by means of a heating fluid in indirect counterflow heat exchange relationship with the treated liquid while the flow rate of the liquid is varied between the first flow rate and the second flow rate to maintain sufficient overall sterilizing effect with minimal overall thermal damage while varying throughput of the liquid.

4,534,987

METHOD OF CONVECTION COOKING OF FOOD

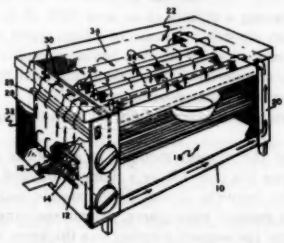
J. Harrison Holman, 340 Promenade East, #223, Portland, Me. 04101, and Jay C. Holman, 1 Orchard Hill Rd., Scarborough, Me. 04074

Continuation of Ser. No. 498,528, May 26, 1983, Pat. No. 4,465,701, which is a division of Ser. No. 233,912, Feb. 12, 1981, Pat. No. 4,386,558. This application Jul. 19, 1984, Ser. No. 632,437

The portion of the term of this patent subsequent to Aug. 14, 2001, has been disclaimed.

Int. Cl.³ A23L 1/00

U.S. Cl. 426—523 2 Claims



1. A method of cooking comprising the steps of:

forming a food cooking unit having an outer casing with air intake vent means, an inner cooking chamber with air entry aperture means, at least one channel between said inner cooking chamber and a corresponding portion of said outer casing, and a heat source inside said inner cooking chamber for heating said inner cooking chamber;

forcing air through said outer casing air intake means into and through said channel between said outer casing and said inner cooking chamber;

cooling said outer casing around said channel by contact with said forced air;

heating said flow of forced air by contact with said heated inner cooking chamber;

directing said heated flow of forced air into said cooking chamber through said air entry aperture means allowing the heated air to assist in the cooking process; and

cooking food in said food cooking unit.

4,534,988

FLAVORING WITH 1, 3-OXATHIANES

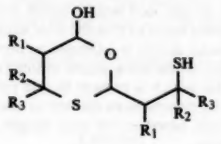
Paul R. Zanno, Hopewell Junction, and Thomas H. Parliment, New City, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Aug. 11, 1980, Ser. No. 176,947

Int. Cl.³ A23L 1/231

U.S. Cl. 426—535 4 Claims

1. A foodstuff having added thereto, as an active flavoring ingredient from 0.1 to 100,000 parts per billion, and effective to impart a beef or chicken flavor thereto, of a compound selected from the formula:



Wherein R_1, R_2 and R_3 are the same or different radicals and which are H or C_1 to C_3 alkyl.

4,534,989

SOFT CANINE BISCUIT CONTAINING DISCRETE MEAT AND/OR MEAT BY-PRODUCT PARTICLES AND METHOD FOR MAKING SAME

Gary Gellman, Pomona, N.Y.; George A. Erfurt, Morristown, and James E. Roe, Wayne, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 549,353, Nov. 7, 1983, and a continuation-in-part of Ser. No. 341,970, Jan. 22, 1982, Pat. No. 4,454,164. This application May 29, 1984, Ser. No. 614,367

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.³ A23K 1/00

U.S. Cl. 426—549 20 Claims

1. A method for making dry soft canine biscuits having discrete meat and/or meat by-product particles distributed substantially uniformly throughout comprising:

(a) dry blending particles containing meat and/or meat by products as substantial components with non-fat solids containing farinaceous material and added sugar, said particles having a moisture content of less than or equal to about 35 percent by weight and being present in an amount sufficient to provide particles visible on the surface of said by soft canine biscuits;

(b) admixing about 20 to 30% by weight water with said dry blended mixture to form a first stage soft dough;

(c) mixing about 0.5–10% by weight fat with said first stage soft dough to form a final soft biscuit dough;

(d) forming said final soft dough into pieces under low shear, non-cooking forming conditions; and

(e) baking and drying said pieces to form dry soft biscuits,

wherein the water activity of said particles in step (a) is less than the water activity of said final soft dough obtained by admixing said non-fat solids, said fat and said water without said particles, and whereby dry, biscuits are produced having discrete visually-apparent meat particles distributed substantially uniformly throughout and embedded in the surface of said dry soft canine biscuits.

4,534,990

SOFT CANINE BISCUIT CONTAINING DISCRETE PARTICLES OF MEAT AND OTHER MATERIALS AND METHOD FOR MAKING SAME

Gary Gellman, Pomona, N.Y.; George A. Erfurt, Summit, and James E. Roe, Wayne, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 341,970, Jan. 22, 1982, Pat. No. 4,454,164. This application Nov. 7, 1983, Ser. No. 549,353

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.³ A23K *1/00*

U.S. Cl. 426—549 **30 Claims**

1. A method for making dry soft canine biscuits from a final biscuit dough comprising:

(a) dry blending particles, which contain (i) meat and/or meat by-product and (ii) farinaceous material and/or textured vegetable protein, and which have a moisture content of less than or equal to about 35 percent by weight of said particles, with non-fat solids to provide a substantially homogeneous dry blended mixture, said particles having a water activity less than the water activity of said final biscuit dough, said non-fat solids portion containing sufficient added sugar so that the total sugar content of the final soft biscuit dough is adequate to provide a final soft biscuit dough, no fat being added in step (a) except for the indigenous fat which is present in said particles, and said particles being present in an amount of about 3 to about 25 weight percent, based on the total weight of said dry soft canine biscuits;

(b) admixing water with said dry blended mixture (a) to form a first stage dough, said water being present in an amount of about 15 to about 35 weight percent, based on the total weight of said final biscuit dough;

(c) mixing added-fat with said first stage dough to form said final soft biscuit dough, said added-fat being present in an amount of about 0.5 to about 10 weight percent, based on the total weight of said final biscuit dough;

(d) forming said final soft biscuit dough into pieces using a low shear forming pressure of less than 75 p.s.i.g. to make said formed pieces; and

(e) baking and drying said pieces to form said dry soft biscuits, which are shelf stable, whereby dry soft canine biscuits are produced having said particles present as discrete visually-apparent particles distributed substantially uniformly throughout and embedded in the surface of said dry soft canine biscuits.

4,534,991

ASEPTIC JUICE OR BEVERAGE AND FLAVOR ENHANCEMENT SYSTEM THEREFOR

Allen C. Kryger, Holland, Mich., assignor to Squirt & Company, Holland, Mich.

Filed Aug. 17, 1983, Ser. No. 524,096

Int. Cl.³ C12G *3/12*; A23L *2/00*

U.S. Cl. 426—592 **19 Claims**

1. A method for preparing an aseptic fruit juice or beverage comprising:

creating an aseptic flavor system by adding sufficient ethyl alcohol of sufficiently high proof to concentrated juice flavor ingredients to yield a flavor system which comprises at least 70% ethanol;

adding sufficient amounts of said aseptic flavor system to a previously pasteurized juice which has been pasteurized to a sufficient degree to render it commercially sterile and aseptic, to form a flavored juice, said amounts sufficient to impart a desired flavor to the juice;

and avoiding heating to pasteurization temperatures after said aseptic flavor system has been added to said juice.

4,534,992

PROCESS FOR THE PRODUCTION OF SOYA PROTEIN FLAKES

Gyota Taguchi, and Toshiji Sato, both of Kanagawa, Japan, assignors to Nisshin Oil Mills, Ltd., Japan

Filed Jan. 6, 1984, Ser. No. 568,593

Claims priority, application Japan, Jan. 10, 1983, 58-1220

Int. Cl.³ A23J *3/00*

U.S. Cl. 426—656 **3 Claims**

1. A process for the production of soya protein flakes comprising admixing raw materials including as a chief ingredient soya protein with water and subjecting the mixture to an extrusion process under heat and pressure by using an extruder having at least a first and second die each having at least one opening and situated perpendicular to the direction of extrusion with an interval of 2–6 mm between the faces of said dies, the distance between a rim of one opening of the first die and the nearest rim of one opening of the second die being greater than or equal to the cross-sectional diameter of said opening of the first die, thereby enabling the formation of flakes having a sponge-like structure and folded parallel to said die faces between the first and second dies.

4,534,993

METHOD OF MANUFACTURING A ROTARY ANODE FOR X-RAY TUBES AND ANODE THUS PRODUCED

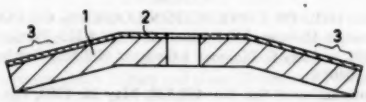
Frederik Magendans; Gerhardus A. te Raa, and Bernhard J. P. van Rheenen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1984, Ser. No. 569,869

Claims priority, application Netherlands, Jan. 25, 1983, 8300251

Int. Cl.³ B05D *1/08*

U.S. Cl. 427—34 **11 Claims**



1. In a method of manufacturing a rotary anode for an X-ray tube, said rotary anode comprising a support member consisting essentially of a molybdenum alloy on which a target layer consisting essentially of tungsten or a tungsten alloy is provided by plasma spraying, the improvement comprising:

(a) deforming a cylindrical member of said molybdenum alloy, having a density of at least 90% of its theoretical maximum density, by means of a high speed deformation impact process to form a disc having a smaller height and larger circumference than said cylindrical member, the degree of deformation being at least 70%;

(b) mechanically shaping the disc to form the support member;

(c) placing the support member in a gaseous atmosphere containing less than 1% by volume of oxygen and having a pressure between 20 and 70 kilopascals; and

(d) in said gaseous atmosphere, plasma spraying the target layer onto the support member to a thickness between 0.2 and 2.0 millimeters while rotating said support member and maintaining it at a temperature between 1000° C. and 1600° C., said layer having a density at least equal to 97% of the theoretical maximum density.

4,534,994

PROCESS FOR MAKING FINE PERFORATIONS IN PLASTIC SHEETING AND/OR PLASTIC OR RUBBER COATED SHEET MATERIALS

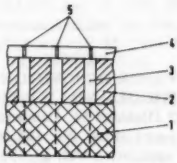
Gerhard Feld, Am Erl-Anger 3, 8501 Eckenthal, and Klaus-Peter Schmidt-Kufeke, Bernhardstr. 5, 7500 Karlsruhe 1, both of Fed. Rep. of Germany

Filed May 3, 1984, Ser. No. 608,023

Claims priority, application Fed. Rep. of Germany, May 3, 1983, 3316118

Int. Cl.³ B05D 3/14

U.S. Cl. 427—37 9 Claims



1. Process for making fine perforations in plastic sheeting and/or plastic or rubber coated sheet materials in which the sheeting or the coating is too thick and/or the dielectric constants thereof are too high for making the fine perforations by electrical pulses, comprising the steps of:

coarsely perforating the material by other means;

coating the perforated material with a layer of a coating material which is capable of being electrically perforated; and

making fine perforations in the layer of the coating material by the use of high-voltage pulses.

4,534,995

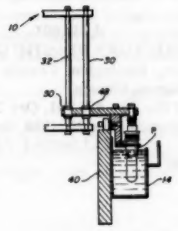
METHOD FOR COATING CONTAINERS

John F. E. Pocock, Stone Mountain; Charles A. Cole, Gainesville; James G. Villanueva, Snellville; John D. Matlack, Lilburn, and Shelton E. Lewis, Norcross, all of Ga., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 5, 1984, Ser. No. 597,090

Int. Cl.³ B05D 7/02, 1/18, 3/14, 7/24

U.S. Cl. 427—38 1 Claim



1. A method of applying a polyvinylidene chloride barrier resin coating to a polyethylene terephthalate preform comprising neutralizing the static charge on said preform by conditioning said preform with ionized air, dipping said preform into a dispersion or latex of said polyvinylidene chloride over a period of 1 to 3 seconds to coat at least the lower two-thirds of said preform, removing said preform from said dispersion or latex over a period of 7 to 14 seconds, drying said coating, and removing the drip which forms on the bottom of the coated preform during said drying step.

4,534,996

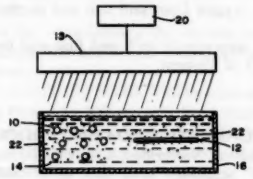
HYBRID MICROSPHERES

Alan Rembaum, Pasadena, and Richard C. K. Yen, Glendale, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 248,898, Mar. 30, 1981, Pat. No. 4,438,239. This application Aug. 29, 1983, Ser. No. 526,953

Int. Cl.³ B05D 3/06

U.S. Cl. 427—44 19 Claims



1. A method of forming a coated product comprising the steps of:

immersing a synthetic organic resin substrate in the form of spheres, particles, sheets, rods or tubes in an aqueous solution containing up to 20 percent by weight of an unsaturated aldehyde containing 4 to 20 carbon atoms;

irradiating the solution with high energy radiation to form an addition polymerized polyaldehyde layer which is covalently bound to the organic resin surface of the substrate; and

binding an antibody to the polyaldehyde layer to form a cell specific surface.

4,534,997

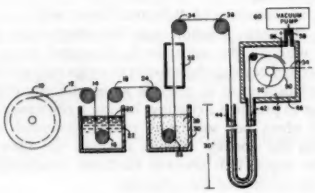
HIGH-TEMPERATURE CARBON FIBER COIL AND METHOD FOR PRODUCING SAME

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Filed Mar. 19, 1984, Ser. No. 591,323

Int. Cl.³ H01L 39/12, 39/24

U.S. Cl. 427—53.1 9 Claims



1. A method of providing an insulative coating on a carbon filament to be wound in a coil, comprising the steps of:

providing a spool of carbon filament;

drawing a filament from said spool;

passing said filament through an adhesive binder bath;

coating said filament with said adhesive binder;

passing said filament through a powdered insulator;

adhering said powdered insulator to said carbon filament by said adhesive binder;

passing said insulator-coated filament then through oven means;

baking said insulator onto said carbon filament;

passing said insulator-coated filament into a firing chamber;

winding said insulator-coated filament into a coil;

heating said insulator-coated filament at a high temperature as it is wound; and

fusing said insulator coating onto said filament to provide insulation of said coil windings from one to another.

6. A method of producing a carbon filament coil comprising the steps of:

combining a carbon filament coil with a particulate insulator;

holding said coil and particulate insulator in a predetermined area;

excluding oxygen from said coil and particulate insulator; and

firing said structure to melt and fuse said insulator around said coils of filament.

4,534,998

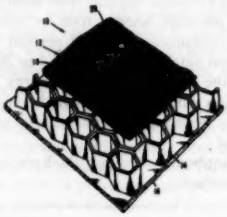
CONDUCTIVE COATING PROCESS

Preston S. DuPont, Northridge; Robert E. Ritter, Palos Verdes, and John P. Stafford, Culver City, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed May 24, 1982, Ser. No. 381,125

Int. Cl.³ B05D *1/02, 5/12*

U.S. Cl. 427—122 **7 Claims**



1. A process of providing a conductive coating on a substrate of dielectric fibers comprising the steps of:

mixing together by high shear mixing a first mixture of carbon black in solvent;

mixing the first mixture into thermosettable resin polymer with hardener by low shear mixing wherein the mixing is sufficiently low shear as to incompletely coat the carbon black particles with thermosettable resin polymer to form a spray solution;

cleaning the substrate of dielectric fibers; and

spraying the spray solution onto the substrate of dielectric fibers wherein the substrate is supported on a metallic support and causing the solvent to evaporate and the resin to thermoset so as to provide an electrically conductive coating to produce a coating, having a resistance of about 6×10^5 ohms per square to reduce potential gradients wherein the coating extends through the fibers to the metallic support to provide electrical conduction away from the surface of the substrate.

4,534,999

PRODUCTION OF MAGNETIC RECORDING MEDIA HAVING A BACKING COATING

Hermann Roller, Ludwigshafen; August Lehner, Roedersheim-Gronau; Joachim Hack, Ludwigshafen; Werner Grau, Bobenheim-Roxheim; Werner Balz, Limburgerhof, and Reinhold Baur, Offenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 630,182

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325556

Int. Cl.³ H01F *10/02*

U.S. Cl. 427—130 **3 Claims**

1. A process for the production of a magnetic recording medium which has a thin backing coating and consists of a non-magnetic flexible base and a magnetic layer which is applied to one side of the base and comprises magnetic material finely dispersed in an organic binder, by applying a dispersion of finely divided non-magnetizable conductive and non-conductive solids and conventional additives in a solution of a polymeric binder in an organic solvent to that side of the base which is opposite the magnetic layer by means of a knife-coater, and then drying the layer, wherein from 3 to 30% by weight, based on the amount of polymeric binder, is a high molecular weight organic compound based on a cellulose reaction product having a K value greater than 75, and wherein the dispersion has a viscosity of from 15 to 200 mPa.s and a solid/solvent ratio of from 1:25 to 1:40, which compound causes the dispersion to exhibit elasticoviscous to thixothropic flow behavior.

4,535,000

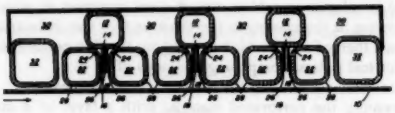
CHEMICAL VAPOR DEPOSITION OF TITANIUM NITRIDE AND LIKE FILMS

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Continuation-in-part of Ser. No. 443,340, Nov. 22, 1982, abandoned. This application Oct. 28, 1983, Ser. No. 546,471

Int. Cl.³ B05B *5/00;* **B05D** *5/00*

U.S. Cl. 427—160 **16 Claims**



1. A process for depositing a transparent, solar control film composed mainly of titanium nitride on a transparent heated glass ribbon substrate, by the steps of

(a) preparing a first preheated gaseous mixture of titanium tetrahalide vapor reactant in an inert carrier gas,

(b) preparing a second preheated gaseous mixture of ammonia reactant, as a nitrogen donor and a reducing gas, and inert carrier gas,

said first and second gaseous mixtures containing at least 0.1 mole percent of said tetrahalide based on the gas in both mixtures and,

(c) mixing the two said gas mixtures at a temperature below 500° C. in the immediate proximity of said substrate which is at a temperature of at least about 500° C. such that a substantially haze free film is formed on by reaction products of said reactants on said glass substrate.

4,535,001

REFRACTORY PLASTIC GUNNING

Brian H. Greener, Burlington, Canada, assignor to Plibrico Limited, Burlington, Canada

Continuation of Ser. No. 436,791, Oct. 26, 1982, abandoned. This application May 29, 1984, Ser. No. 614,699

Int. Cl.³ B05D *1/12*

U.S. Cl. 427—180 **1 Claim**

1. A method of forming a refractory lining on a surface at a job site comprising the steps of;

granulating by means of a granulator at said job site a plastic refractory material having a moisture content in the range of 4% to 16% by weight to provide loosely arranged granular refractory material said granulator directly com-

municating with a pneumatic gunning pump and immediately after granulating pneumatically gunning the loosely arranged granulated refractory material onto the surface without adding water at the discharge nozzle.

4,535,002

PROCESS FOR RENDERING A MATERIAL FIRE RETARDANT

William J. Kirkhuff, Irvine, Calif., assignor to Kirkhuff, Shield & Fink, Santa Ana, Calif.

Division of Ser. No. 343,880, Jan. 29, 1982, Pat. No. 4,443,258, which is a continuation-in-part of Ser. No. 214,220, Dec. 8, 1980, abandoned. This application Apr. 13, 1984, Ser. No. 599,768

Int. Cl.³ B05D *1/36*

U.S. Cl. 427—203 **6 Claims**

1. A process of rendering a material fire retardant which comprises:

overlaying said material with at least one layer of a permeable mass of silica glass;

permeating among and associating within said permeable mass of silica glass a quantity of the unexpanded form of heat expandable perlite wherein said perlite is present as particles of a mesh size less than 100 mesh and said quantity of perlite is a quantity at least equal to the weight of said permeable mass of said silica glass.

4,535,003

SURFACE MODIFYING COMPOSITIONS FOR VULCANIZED RUBBER AND METHOD OF MODIFYING VULCANIZED RUBBER SURFACE USING THE SAME

Masaki Ogawa, Kodaira, and Yasuro Shiomura, Higashimurayama, both of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1984, Ser. No. 577,907

Claims priority, application Japan, Apr. 4, 1983, 58-57917

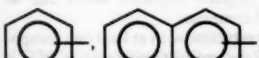
Int. Cl.³ B05D *5/10;* **C08L** *91/06*

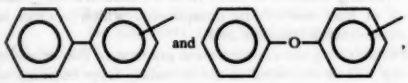
U.S. Cl. 427—207.1 **14 Claims**

1. A surface modifying composition for vulcanized rubber comprising a halogen-releasable halogenoid, a waxy substance having a melting point of not more than 100° C., and an inorganic filler, and being non-solvent type, wherein the weight of the inorganic filler is in a range of 15–80% based on the whole surface modifying composition, and 0.6–20 times that of the halogen-releasable halogenoid, said halogen-releasable halogenoid is a compound containing N,N-dihalosulfonamide group and represented by the following general formula:

$$R—SO_2NX_2 \text{ or } R'_m—(Ar)—(SO_2NX_2)_n$$

wherein X is a halogen atom, R and R′ represent an aliphatic hydrocarbon residue having a carbon number of 1–6 and further R′ may be a hydrogen atom or a halogen atom, Ar is a residue selected from





and

, and

m and n are an integer of 1–3, respectively.

4,535,004

CONSOLIDATING THE SURFACE OF A GRANULAR ADSORBENT

Franz Haas; Gerhard Janisch, and Gerold Schreyer, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,600

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211900

Int. Cl.³ B05D *3/02, 7/00*

U.S. Cl. 427—212 **5 Claims**

1. A process for consolidating the surface of a granular adsorbent, wherein the adsorbent, which initially contains virtually no water,

(1) is treated, while being mixed, with an aqueous suspension containing from 1 to 30% by weight of filamentous thermoplastic structures of self-crosslinking copolymers, in such a way that the granular adsorbent takes up water from the suspension and at the same time the suspended filamentous structures deposit on the surface of the adsorbent, the latter remaining free-flowing,

(2) the water taken up by the adsorbent is evaporated and

(3) the adsorbent covered with the filamentous structures is heated at 110°–180° C. in order to crosslink the copolymer.

4,535,005

CONSOLIDATING THE SURFACE OF A GRANULAR ADSORBENT

Franz Haas; Gerhard Janisch, and Gerold Schreyer, all of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,602

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211629

Int. Cl.³ B05D *3/02, 7/00*

U.S. Cl. 427—212 **4 Claims**

1. A process for consolidating the surface of a granular adsorbent, wherein the adsorbent, which initially contains virtually no water,

(1) is treated with 25–70% by weight of the maximum possible amount of water which it can take up to saturation,

(2) is heated to a temperature at which the water taken up evaporates,

(3) and is treated, while water taken up is evaporating, with an aqueous dispersion of a self-crosslinking copolymer, while mixing, the ratio of the weight of copolymer adhering to the adsorbent to the weight of adsorbent being from 2:98 to 30:70 and,

(4) the adsorbent thus coated is heated at from 110° to 180° C. in order to crosslink the copolymer.

4,535,006

DEVICE FOR USE IN FLUIDIZED BED TECHNIQUES AND ITS METHOD OF USE

Dietmar Naunapper, Oberrimsingen, and Günter Braun, Grenzach-Wyhlen, both of Fed. Rep. of Germany, assignors to Glatt GmbH, Binzen, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,966

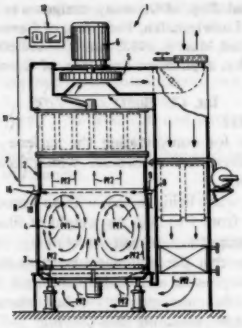
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1982, 3237303

Int. Cl.³ B05D *1/22*

U.S. Cl. 427—213 **14 Claims**

1. A device for fluidized bed techniques, particularly for coating material such as tablets or the like, said device comprising a container for use as a processing zone for the material to be processed, means for moving said material through said

processing zone, and at least two sensors for detecting the upper and lower critical height values of the upper end area of



said processing zone, said sensors being mounted on said device one above the other.

4,535,007

SILICON NITRIDE-CONTAINING CERAMICS

John P. Cannady, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 2, 1984, Ser. No. 627,260
Int. Cl.[3] B05D *3/02*
U.S. Cl. 427—226 **52 Claims**

1. A method of preparing a silicon nitride-containing ceramic material, which method comprises (1) treating a R_3SiNH-containing silazane polymer with a reactive metal halide of general formula MX_n or $R_bSiX_{(4-b)}$ at a temperature below the softening point of the R_3SiNH-containing silazane polymer for a time sufficient to render the silazane polymer infusible where R is selected from the group consisting of vinyl, hydrogen, phenyl, and alkyl radicals containing 1 to 3 carbon atoms; M is a metal atom of valence n; X is a halide atom selected from the group consisting of chlorine and bromine; and b has a value of 0, 1, or 2; where said reactive metal halide has fewer carbon atoms than the R_3SiNH-endblocking group; and where said reactive metal halide has at least two halide atoms; and (2) heating the infusible silazane polymer of step (1) in an inert atmosphere or vacuum to a temperature of at least 750° C. until said infusible silazane polymer is converted to a silicon nitride-containing ceramic material.

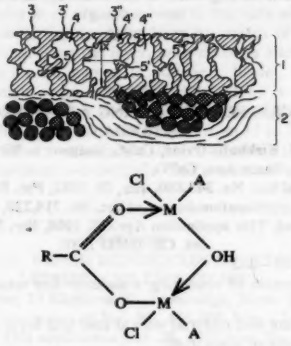
4,535,008

MOISTURE-PERMEABLE WATERPROOF COATED FABRIC HAVING A MICROPOROUS POLYURETHANE LAYER

Yasushi Naka, 4-2, Asahigaoka-cho, Hirakata-shi, Osaka-fu, and Kiyoshi Kawakami, 57, Hiragaki-cho, Karahashi, Minami-ku, Kyoto-shi, Kyoto-fu, both of Japan

Division of Ser. No. 286,615, Jul. 24, 1981, Pat. No. 4,429,000, which is a continuation of Ser. No. 102,410, Dec. 11, 1979, abandoned. This application Oct. 28, 1983, Ser. No. 546,286
Int. Cl.[3] B05D *5/00*
U.S. Cl. 427—246 **2 Claims**

1. A method of making a coated fabric having both waterproofness and moisture permeability characterized in that, in forming a microporous polyurethane layer by applying a polar organic solvent solution of a polyurethane elastomer to a base fabric, then immersing the base fabric in a coagulating bath to allow gelation to take place, followed by water-washing and drying, there is used as the coating solution a polar organic solvent solution containing a polyurethane elastomer and a metal complex represented by the following general formula;



where R is a hydrocarbon radical having 8 or more carbon atoms, M is Cr or Al, and A is Cl or OH.

4,535,009

METHOD FOR PRODUCING A COMPOSITE SHEET MATERIAL

Minoru Tanaka, 1419, Onza Godo, Godo-cho, Ampachi-gun, Gifu-ken; Hideo Nakamura, 106, Yashima-cho, Ogaki-shi, Gifu-ken, and Shunji Mizuguchi, 5-21, Shimizu-cho, Nishinomiya-shi, Hyogo-ken, all of Japan

Filed Nov. 22, 1983, Ser. No. 554,212
Claims priority, application Japan, Nov. 24, 1982, 57-204535
Int. Cl.[3] B05D *3/10, 3/12, 5/00*
U.S. Cl. 427—246 **17 Claims**

1. A method for producing a composite sheet material which comprises impregnating and/or coating a fibrous sheet with a mixture of (A) a polyurethane elastomer containing a sterically hindered amino group within its molecular chain, (B) a compound selected from the group consisting of a polybasic acid and its halide, metal salt and ammonium salt, wherein one or more hydrogen atoms remain unreacted, which amount of (B) is within the range of 0.8–5 molar equivalents relative to the sterically hindered amino group, and (C) a solvent for the polyurethane elastomer (A), and subjecting the resulting material to wet coagulation.

4,535,010

METHOD OF FORMING POLYMERIC LAYERS

Rolf E. Axén, Bälinge; Göran L. Kaj, and Bror S. Rigner, both of Uppsala, all of Sweden, assignors to Pharmacia AB, Uppsala, Sweden

Filed Oct. 17, 1983, Ser. No. 542,507
Claims priority, application Sweden, Oct. 18, 1982, 8205908
Int. Cl.[3] B05D *5/00*
U.S. Cl. 427—246 **12 Claims**

1. A method of forming at least one polymeric layer on a solid substrate wherein each applied polymeric layer is formed by the cross-linking of an organic substance which can be cross-linked, which method comprises

(a) impregnating the solid substrate with at least one component which can control the cross-linking reaction,

(b) contacting the impregnated solid substrate with a surrounding solution so as to form a concentration gradient of at least one of the components which control said cross-linking reaction, and

(c) establishing the concentration gradient so that cross-linking will be restricted to the boundary layer between said solid substrate and said surrounding solution and will not occur throughout the surrounding solution.

4,535,011

MONO (PENTAFLUOROSULFUR DIACETYLENE, POLYMER THEREFROM, AND PREPARATIONS THEREOF

Thomas A. Kovacina, McConnellsburg, Pa.; Ronald A. DeMarco, Fairfax, and Arthur W. Snow, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 16, 1983, Ser. No. 562,251

Int. Cl.[3] **C23C** *11/00;* **C08F** *12/30, 112/30, 212/18*

U.S. Cl. 427—255.6 **2 Claims**

1. A method of coating poly mono(pentafluro sulfur)diacetylene on a surface which comprises maintaining mono(pentafluorosulfur)diacetylene at a temperature from about −20 to about 30 degrees C. to provide a gas and exposing said surface to said gas until sufficient mono (pentafluorosulfur)diacetylene has polymerized on said surface.

4,535,012

FAST CURING SOLDERABLE CONDUCTOR

F. Wayne Martin, Baldwin Place; Samson Shahbazi, Yonkers, and Ronald J. Schoonejongen, Carmel, all of N.Y., assignors to Electro Materials Corp. of America, Mamaroneck, N.Y.

Filed Sep. 30, 1983, Ser. No. 537,735

Int. Cl.[3] **B05D** *3/02*

U.S. Cl. 427—386 **18 Claims**

1. A method for forming a solderable electrically conductive film comprising the steps of dissolving carboxylated vinyl in a solvent to form a solution, mixing said solution with metallic silver particles and an moderate chain length epoxy to form an ink, applying said ink to a substrate to form a film thereon and applying heat to said film to evaporate said solvent to leave a solderable electrically conductive film on said substrate.

4,535,013

ADDITION OF RESINS TO LATEX BONDED NONWOVEN FABRICS FOR IMPROVED STRENGTH

Beryl M. Kuhn, 830 Sugar Creek Dr., Conyers, Ga. 30208

Filed Aug. 15, 1983, Ser. No. 523,493

Int. Cl.[3] **B05D** *3/02;* **C08L** *93/04;* **C09J** *7/00*

U.S. Cl. 427—389.9 **19 Claims**

10. A method for increasing the multi-directional strength of nonwoven polyolefin-containing fabrics comprising

contacting a corresponding fiber web with a binding amount of a lower temperature binder system comprising

(A) An essentially non-crosslinkable non-crystalline polymer of at least one component selected from the group consisting of an ethylene/acrylic acid, styrene/lower alkyl acrylate, styrene/butadiene, ethylene/ethylacrylate, ethylene/vinyl acetate, and combination thereof with up to about 10 weight percent of acrylic or methacrylic acid as a third monomeric component; combined with

(B) about 5–35 weight percent based on total binder solids, of a rosin ester dispersion of at least partially hydrogenated rosin with a polyhydric alcohol, the ester component having an abietic acid concentration not exceeding about 2 weight percent, a drop softening point above about 70° C., and an average molecular weight not exceeding about 2000; then

drying and curing the treated fiber web to obtain a fabric.

4,535,014

METHOD OF MOLDING A MULTI-COLORED ARTICLE

Douglas Wright, Windsor, Calif., assignor to Frederick Bugay, San Francisco, Calif.

Filed Oct. 1, 1981, Ser. No. 307,439

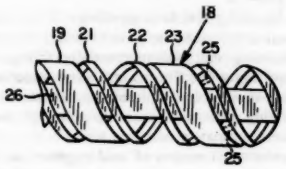
Int. Cl.[3] **B44T** *1/10;* **B32B** *3/10*

U.S. Cl. 428—30 **5 Claims**

1. A method of manufacturing of an elongated article with multiple discrete molding materials of different colors by injection molding, the article have a series of juxtaposed surface color variations in a repeating pattern on all surfaces around the periphery of the article, comprising:

a. preparing a separate mold for each separate shot of molding material, a first mold being shaped to conform to the pattern desired for the first material, the pattern being a repeating pattern of multiple components in an elongated configuration on all surfaces around the periphery of the article and making up a portion of the surface area of the elongated article, the first mold including a cavity which forms during the first shot an interior elongated, unitary contiguous spine piece connecting and integral with the various first-material components of the pattern, sufficiently strong once formed to prevent the pressure of succeeding shot from distorting the pattern, and having interstices for the succeeding shot which are contiguous from one end of the article to the other;

b. inserting the first mold into an injection molding machine;



c. feeding molding material into the machine and heating the material to a point suitable for injection molding;

d. injecting the first shot of molding material from a single mold entry point in a continous flow of material among the spaces for that material and filling the first mold cavity with the first shot to form the interior spine piece as well as the pattern for the first material, as a preliminarily molded part;

e. placing the preliminarily molded part into a succeeding mold for a succeeding shot which fits closely over at least a part of the surface pattern of the premliminary part and which is shaped to form additional outer surface of the molded article; and

f. injecting the succeeding shot material, from a single mold entry point leading to said contiguous interstices, into the succeeding mold cavity to fill gaps in the preliminary part between components of the pattern.

4,535,015

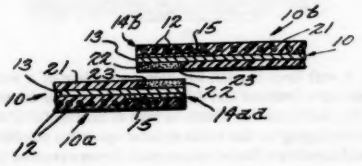
WEFT INSERTED WARP KNIT CONSTRUCTION

Jeffrey W. Bruner, Greensboro; Delbert A. Davis, Kernersville, and Jack Leach, Greensboro, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 2, 1984, Ser. No. 585,860

Int. Cl.[3] **B32B** *3/00*

U.S. Cl. 428—44 **23 Claims**



1. A large textile panel consisting essentially of:

a plurality of small textile panels;

each small textile panel comprising a weft inserted warp knit fabric having a reinforcing substrate strip stitched thereto along the selvedges thereof to form an integral part of the

panel, said strips spaced from each other along the width of the panel, and said panel having a chemical finish thereon;

at least one selvedge edge of each of said small panels overlapping an adjacent selvedge edge of another small panel, the overlapping of the edges not extending past the selvedge edge substrate strips of each of the panels; and

means for holding the overlapped selvedge edges together in sealed relationship.

4,535,016

INSULATING ARTICLE AND METHOD OF MAKING SAME

John M. Bradley, Box 327, Manchester, Mass. 01944

Continuation-in-part of Ser. No. 530,895, Sep. 12, 1983, abandoned. This application Jul. 20, 1984, Ser. No. 633,042

Int. Cl.³ B32B *1/04*

U.S. Cl. 428—74 **10 Claims**

1. An insulating article comprising:

(a) a sealed permeable-to-gas envelope;

(b) insulating material substantially filling said envelope comprising a fine fibrous insulating material;

(c) finely divided hydrophobic particulate metal oxide said insulating material in said envelop; or metalloid oxide pigment intimately admixed with

(d) a substantial excess of said pigment in said envelope beyond that required substantially completely to cover all surfaces of said material with a mono-layer of said pigment particles touching each other; and

(e) said envelope adapted substantially to retain said pigment within said envelope.

4,535,017

HEAT-RESISTANT LINING FOR WALL, SUCH AS HELICOPTER ENGINE COMPARTMENT BULKHEAD, AND WALL LINED THEREWITH

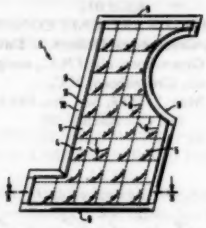
Wilfried Kuckein, Neubiberg; Albert Mylius, Brunnthal; Peter Bechtel, Ludwigshafen, and Adalbert Höfer, Limburgerhof, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich and G & H Montage GmbH, Ludwigshafen, both of, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 360,983

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111596

Int. Cl.³ F02C *7/24;* **B64C** *1/40;* **E04B** *1/76;* **B32B** *15/14*

U.S. Cl. 428—77 **17 Claims**



1. A soft liner blanket for lining a surface of a wall that is subject to vibrations and flexure in order to permanently protect the wall from the effects of heat in excess of 200° C. otherwise impinging on that surface under operating conditions, and of withstanding a flame temperature for an extended period of time on the order of five minutes without any local destruction and without any change in position of the liner blanket relative to the wall,

said liner blanket being generally planar and comprising:

a core layer made of minral fiber felt and having an outer peripheral edge;

an exposed front side covering of metal foil having means providing a heat-reflective front surface;

a rear covering made of a fabric for providing a supporting layer;

said front side covering of metal foil terminating several millimeters short of said outer peripheral edge of said core layer so as to provide a compressible marginal rim about the outer periphery of the liner blank, said liner blanket within said rim being as a result more compressible in the plane of said liner blanket than is said liner blanket in a main portion thereof that is defined inwardly of said marginal rim;

said rim being composed of a fabric layer of fiberglass material; and

means effectively securing said rim layer on said front side covering, on said core layer and on said rear covering so that said rim is loosely enclosed by said rim layer.

4,535,018

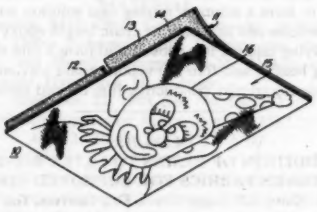
COMPOSITE DECORATIVE ARRANGEMENT WITH DUAL ADHESIVE CHARACTERISTICS

Martin Freling, Paramus, N.J., assignor to Meyer Label Co., Inc., New York, N.Y.

Filed May 12, 1983, Ser. No. 493,774

Int. Cl.³ B44C *1/16*

U.S. Cl. 428—79 **14 Claims**



1. A novelty decorative arrangement utilizing, in composite relation:

a substrate having a first overall configuration and having first and second sides, said substrate further having a first design on said first side thereof;

a fabric element having first and second surfaces, including a second design on said first surface and a heat-responsive adhesive on said second surface, said fabric element having a second overall configuration with dimensions at least as large as those of said first overall configuration of said substrate to initially cover said second side of said substrate; and

adhesive means having a substantially tacky consistency applied to said second side of said substrate and in contact with said heat-responsive adhesive for detachably coupling said fabric element to said substrate, whereby said adhesive means remains on said substrate upon detachment of said fabric element therefrom.

4,535,019

LAMINATED WOOD COUPLING ARRANGEMENT

Hector M. Coronado, 2209 Via Cerritos, Palos Verdes Estates, Calif. 90274

Filed Jun. 4, 1981, Ser. No. 270,265

Int. Cl.³ B32B *5/12*

U.S. Cl. 428—106 **11 Claims**

1. A laminated wood coupling arrangement, comprising in combination:

a plurality of layers;

a first portion of said plurality of layers having at least a first wood strip and a second wood strip;

a second portion of said plurality of layers having at least a fifth wood strip and a sixth wood strip;

each of said wood strips in each of said first portion and second portion of said plurality of layers having:

an upper planar surface;

a lower planar surface spaced a transverse distance from and parallel to said upper planar surface and said transverse distance defining the thickness of said wood strip;

a front surface;

a rear surface spaced longitudinally from said front surface and said longitudinal spacing defining the length of said wood strip;

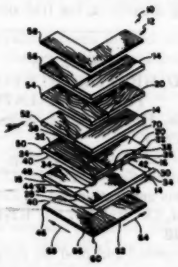
a first side surface;

a second side surface spaced a lateral distance from said first side surface and said lateral distance defining the width of said wood strip; and

wood fibers creating the grain of the wood running substantially along said longitudinal length from said front surface to said rear surface;

said first wood strip having the same thickness as said second wood strip;

said fifth wood strip having the same thickness as said sixth wood strip;



said front surface of said first strip aligned with said second side surface of said second strip, said rear surface of said second strip abutting said first side surface of said first strip, and said lower surfaces of said first and second strips substantially coplanar;

said front surface of said fifth strip abutting said first side surface of said sixth strip, said rear surface of said sixth strip aligned with said second side surface of said fifth strip, and said lower surfaces of said fifth and sixth strips substantially coplanar;

said rear surface of said sixth strip substantially aligned vertically with said second side surface of said first strip;

said front surface of said first strip substantially aligned vertically with said second side surface of said sixth strip;

said first and second portions in superimposed relationship having one of said second portion of said plurality of layers coupled in superimposed relationship to and in aligned relationship with said first portion of said plurality of layers, and said first portion of said plurality of layers coupled in superimposed relationship to and in aligned relationship with said second portion of said plurality of layers; and

said first portion and said second portion in alternating relationship.

4,535,020

PERFORATED FILM

Paul E. Thomas, and Garland E. Raley, both of Terre Haute, Ind., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 401,939, Jul. 26, 1982, Pat. No. 4,456,570.
This application Jan. 9, 1984, Ser. No. 569,405
Int. Cl.³ B32B *3/10*; A61L *15/00*
U.S. Cl. 428—131 **14 Claims**

1. A thermoplastic film forming resin in the form of a perforated, self-supporting sheet characterized in that,

(a) said self-supporting sheet containing along with the resin a sufficient amount up to about ten percent by weight based on the weight of the resin of a polarizable migrating surfactant to provide the self-supporting sheet with a runoff of less than about ten percent;

(b) said self-supporting sheet having perforations that are tapered capillaries;

(c) said self-supporting sheet having been treated with a corona discharge; and

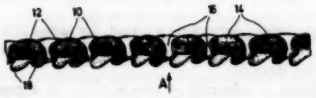
(d) said corona discharge treated surface of said self-supporting sheet having a run off of less than ten percent.

4,535,021

BACKING MAT FOR A GROUND COVERING, PREFERABLY FOR A WATER-PERMEABLE ARTIFICIAL GRASS, AS WELL AS A METHOD FOR ITS PRODUCTION

Hans-Joachim Friedrich, Auenwald, Fed. Rep. of Germany, assignor to J. F. Adolff AG, Fed. Rep. of Germany

Filed Mar. 7, 1984, Ser. No. 587,242
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310640
Int. Cl.³ A01N *3/00*; A41G *1/00*
U.S. Cl. 428—137 **14 Claims**



1. A backing mat for a ground covering such as artificial grass comprising a grid-like structure of elastically pliable formed plastic sections having openings arranged therebetween, characterized in the provision of bulbous projections on the underside of the mat, said projections being located at the edges of at least some of said openings and projecting downwardly beyond the material in the center regions of said sections between said openings, each of said projections being limited to less than the full periphery of the opening with which it is associated.

4,535,022

DECORATIVE TILE AND METHOD FOR MANUFACTURING THE SAME

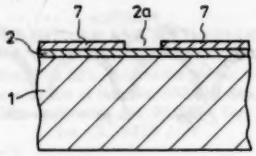
Chizuo Kato, Tokyo, Japan, assignor to Aluteck Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1984, Ser. No. 628,401

Claims priority, application Japan, Jul. 8, 1983, 58-106186[U]; Feb. 15, 1984, 59-26792; May 8, 1984, 59-91643

Int. Cl.³ B32B *3/30, 17/06*

U.S. Cl. 428—142 4 Claims



1. A decorative tile comprising:

(a) a ceramic tile blank of desired shape having a roughened surface,

(b) a first layer of metal spray-deposited on the roughened surface,

(c) a second layer of metal attached to the first layer and being discontinuous with the first layer, thereby defining a decorative pattern on the first layer, and

(d) a transparent coating material covering the roughened surface of the tile and the two layers of metal.

4,535,023

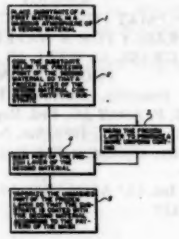
PROCESS FOR FABRICATING CRYOGENIC TARGETS AND TARGETS MADE THEREBY

Robert R. Whitlock, College Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 3, 1983, Ser. No. 500,724

Int. Cl.³ B32B *3/10;* B05D *5/00, 1/32*

U.S. Cl. 428—195 19 Claims



1. A process of patterning a target, for lasing at X-ray wavelengths, from materials which cannot be readily shaped, comprising the steps of:

(a) placing a substrate of one material in a gaseous atmosphere of another material;

(b) ensuring that the substrate is below the freezing point of the other material so that a frozen layer of the other material condenses onto the substrate:

(c) masking part of the frozen layer of the other material; and

(d) vaporizing the unmasked part of the frozen layer so that the substrate of the one material is coated with the other material according to the pattern of the mask.

14. The target formed in accordance with the process recited in claim 1, wherein:

the one material is a pump material, and the other material is neon.

4,535,024

GLOSS BLACK METALIZED PRODUCT AND METHOD OF PREPARATION

Harry A. Parker, Murray Hill, N.J., assignor to Transfer Print Foils, Inc., East Brunswick, N.J.

Filed Nov. 1, 1982, Ser. No. 438,220

Int. Cl.³ B32B *3/00, 15/08*

U.S. Cl. 428—200 8 Claims

1. A decorative laminate offering a glossy black outer appearance of improved durability, comprising:

A. at least one base film;

B. a translucent, black reflective metal coating comprising a chromium-containing metal having a black appearance, applied over one surface of said base film, said coating formed by heating said metal to an elevated temperature above its boiling point and above the normal vaporization temperature of the metal, and vapor depositing said metal on said base film while maintaining said metal at said elevated temperature; and

C. a top coat comprising a clear thermoplastic resin, applied over the free surface of said translucent metal coating.

2. The laminate of claim 1 wherein

said base film is pigmented,

a tie coat is present between said base film and said translucent metal coating, and

an intermediate coat comprising an organic resinous coating material curable by ultraviolet light is present between said top coat and said translucent metal coating.

3. The laminate of claim 2 further including a heat-sensitive adhesive coating located on the free surface of said base film.

4,535,025

ORIENTED, HIGH DENSITY POLY(ETHYLENE TEREPHTHALATE)

Saleh A. Jabarin, Holland, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 537,129, Sep. 29, 1983, abandoned, which is a continuation of Ser. No. 427,063, Sep. 29, 1982, abandoned. This application Jul. 6, 1984, Ser. No. 628,360

Int. Cl.³ B32B *27/36;* B29D *17/02*

U.S. Cl. 428—220 2 Claims

1. Biaxially oriented and heat set poly(ethylene terephthalate) material which has two substantially parallel faces each of an area which is extended as compared to the area of any planar cross-section cutting said two faces, the ratio of the said extended area to said cross-sectional area being at least 10, said poly(ethylene terephthalate) being clear, ductile and having a density at 25° C. of over 1.4050 and a percent haze of no more than 10 percent.

4,535,026

ANTIREFLECTIVE GRADED INDEX SILICA COATING, METHOD FOR MAKING

Bulent E. Yoldas, Churchill, and Deborah P. Partlow, Wilkinsburg, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 29, 1983, Ser. No. 509,118

Int. Cl.³ C03C *15/00*

U.S. Cl. 428—310.5 14 Claims

1. A radiation-transmitting non-porous vitreous substrate of predetermined refractive index having coated on at least one surface thereof a substantially non-reflecting coating which

functions effectively over a predetermined wide band of radiations, said non-reflecting coating comprising:

a single silica layer overcoated on said non-porous substrate and having an exposed surface, the thickness of said silica layer as measured between the exposed surface thereof and the silica layer-substrate interface being generally uniform and in the range of from about 150 nm to about 600 nm with the silica layer displaying throughout its thickness at least ome degree of porosity, and the porosity of said overcoated silica layer together with the non-porous nature of said substrate forming a defined interface therebetween;

all of said silica layer consisting essentially of silica except for other glass-forming constituents which may diffuse from said substrate and into said silica layer proximate said layer-substrate interface during the forming-processing of said silica layer on said substrate;

that portion of said silica layer which is immediately proximate the exposed surface thereof displaying the highest degree of porosity and the porosity of said silica layer gradually decreasing from the exposed surface thereof to a depth which is at least about one-quarter of the longest wavelength of said predetermined wide band of radiations to provide a graded degree of porosity which decreases as the distace from the exposed surface thereof increases;

that portion of said silica layer which is immediately proximate the exposed surface thereof having an index of refraction which approaches unity, and that portion of said silica layer which is immediately proximate the interface between said silica layer and said substrate having an index of refraction which approaches that of said substrate; and

the size of the individual pores in said silica layer being sufficiently small that radiations impinging upon the exposed surface of said silica layer are transmitted therethrough without being significantly scattered.

8. The method of applying to a radiation-transmitting non-porous vitreous substrate of predetermined refractive index a substantially non-reflecting coating which functions effectively over a predetermined wide band of radiations, which method comprises:

preparing a coating solution comprising a mixture of a predetermined molar amount of silicon alkoxide of the formula $Si(OR)_4$ where R is alkyl having from one to six carbon atoms, water in amount of from about 1.9 moles to about 2.6 moles per mole of alkoxide, organic solvent in which both said alkoxide and said water are miscible and in such amount that the total silicon alkoxide when expressed in terms of equvalent SiO_2 content is from about 12% to about 18% by weight of said coating solution, and a small amount of mineral acid catalyst, and heating and then cooling the mixed solution constituents under predetermined conditions to effect a controlled hydrolysis and polymerization thereof;

applying the prepared coating solution to the substrate to be coated as a generally uniform liquid film, and rapidly drying the applied film under low humidity conditions to form a residual layer having a thickness of from about 300 nm to about 1200 nm;

heating the substrate and the coated layer at a predetermined temperature and for a predetermined time first to drive residual organic material and hydroxyl radicals therefrom and then to heat treat the residual silica to form a thin layer consisting essentially of porous silica except for any minor proportion of glass-forming constituent which may diffuse from the substrate during the heating thereof into the porous silica layer proximate the silica layer-substrate interface, with the size of the individual pores of said porous silica layer being sufficiently small that radiations intended to pass through said substrate are not significantly scattered by the pores in said porous silica layer; and

applying to the exposed surface of said formed porous silica layer a relatively weak silica etching solution for a predetermined time sufficient to enlarge in a graded fashion the existing pores in the porous silca layer to a depth, measured from the exposed surface, which is at least about one-quarter of the longest wavelength of radiations of said predetermined wide band of radiations to provide a graded degree of porosity which decreases as the distance from the exposed surface of said silica film increases, with the size of the largest pores in said silica layer being sufficiently small so as not to significantly scatter the radiations intended to be passed through said substrate.

4,535,027

HIGH STRENGTH POLYACRYLONITRILE FIBER AND METHOD OF PRODUCING THE SAME

Toshiyuki Kobashi, and Seiji Takao, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Mar. 26, 1984, Ser. No. 593,239
Claims priority, application Japan, Apr. 20, 1983, 58-70449
Int. Cl.³ D02G *3/00*
U.S. Cl. 428—364 **1 Claim**

1. A polyacrylonitrile fiber having a tensile strength not less than 20 g/d, and produced from a polymer composed mainly of acrylonitrile and having a weight average molecular weight not less than 400,000.

4,535,028

HOLLOW FIBER OF CUPRAMMONIUM REGENERATED CELLULOSE AND PROCESS FOR PRODUCING THE SAME

Masanobu Yokogi; Yoshifumi Sugimoto, and Yotsuo Ono, all of Miyazaki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha and Asahi Medical Co., Ltd., both of Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,296
Claims priority, application Japan, Oct. 1, 1981, 56-154808
Int. Cl.³ D02G *3/00*; B01D *39/00*
U.S. Cl. 428—398 **12 Claims**

1. A hollow fiber of cuprammonium regenerated cellulose having an axially disposed cylindrical bore extending throughout the fiber length, said fiber length being at least 10 m, said bore having an inside diameter of from 50 to 800 microns and being filled with a gas, and said hollow fiber having on its inside wall no trace of a liquid.

8. A process for producing a hollow fiber of cuprammonium regenerated cellulose having an axially disposed cylindrical bore extending throughout the fiber length of at least 10 m and having on its surface wall no trace of a liquid, said bore having an inside diameter of from 50 to 800 microns and being filled with a gas, which comprises the steps of:

(1) extruding a spinning solution of cuprammonium cellulose through an annular orifice to form a fiber extrudate with a bore while simultaneously injecting a gas into the bore of the fiber extrudate through an injection tube provided in the center of the annular orifice;

(2) allowing said fiber extrudate to free fall in an air space and substantially vertically dive into a depth of from 2 to 20 mm below the surface of a coagulation bath only with a downward force gained during said free fall;

(3) passing the fiber extrudate through the coagulation bath to obtain a hollow fiber having an axially disposed cylindrical bore; and

(4) refining and drying the so-obtained hollow fiber.

4,535,029

METHOD OF CATALYZING METAL DEPOSITIONS ON CERAMIC SUBSTRATES

Josef Intrater, Englewood Cliffs, N.J., and Gene Bertoldo, New York, N.Y., assignors to Advanced Technology, Inc., Palisades Park, N.J.

Filed Sep. 15, 1983, Ser. No. 532,618

The portion of the term of this patent subsequent to Nov. 9, 1999, has been disclaimed.

Int. Cl.³ B32B 9/00, 15/04

U.S. Cl. 428—408 11 Claims

1. A composite of tin, lead, indium, a tin alloy, a lead alloy, an indium alloy, or a mixture thereof as a component in combination with a carbide or carbonyl fomer and a small portion of about 2%, by weight, platinum, palladium or mixture thereof as a catalyst for improving an adherent coating, film or layer and wherein the balance, by weight, is said coating, on a base or substrate of a carbon, diamond, silicon, carbide, alumina, zirconia, sapphire, quartz, graphite, nitride, oxide, arsenide, titanate, silicide, boride, telluride, phosphide, pyrolitic graphite, silicon carbide, boron carbide, a mixed carbide, tungsten carbide, oxides of metals or metalloids, aluminum gallium arsenide, gallium arsenide, gallium phosphide, lanthanum boride, barium titanate, zirconium ortho silicate, zinc oxide, magnesium silicate, aluminum silicate, silicon nitride, beryllium oxide, boron nitride or titanium diboride.

4,535,030

COATED SUBSTRATE

Nicholas A. Rounds, 271 Tamenend Ave., New Britain, Pa. 18901

Continuation-in-part of Ser. No. 551,445, Nov. 14, 1983,. This application Apr. 13, 1984, Ser. No. 599,835

Int. Cl.³ B32B 27/08, 27/36; G01D 15/34

U.S. Cl. 428—413 18 Claims

1. An information storage device having a polymeric coating thereon, said device comprising a coatable substrate capable of having information encoded on its surface, said polymeric coating having been formed on said surface of said device from the polymerization of a coating composition which comprises a diacrylate and a diester of beta-acryloxypropionic acid, said diacrylate being present in an amount of from about 4% to about 85% by weight of said diacrylate and said diester, said diacrylate being selected from the class consisting of glycol esters of acrylic acid wherein the glycol portion of the ester has the formula $HO[(CH_2)_mCHR—O]_nH$, wherein R is hydrogen or methyl, m is from 1 to about 2 and n is from 1 to about 4, neopentyl glycol, ethoxylated neopentyl glycol, and propoxylated neopentyl glycol, and from about 15% to about 96%, based on the weight of said diacrylate and said diester, of said diester of beta-acryloxypropionic acid selected from the class consisting of the neopentyl glycol ester of di(beta-acryloxypropionic acid) and the esters of glycols having the formula $HO[(CH_2)_mCHR—O]_nH$, wherein R is hydrogen or methyl, m is from 1 to about 2 and n is from 1 to about 4, a surfactant, and, if said coating composition is to be ultra violet or visible light cured, a photoinitiator.

4,535,031

MODIFIED AMINOPLAST, ITS PREPARATION AND ITS USE

Peter Dorries, Frankfurt am Main; Thomas Götze, Neuenhain; Steffen Piesch, Oberursel; Manfred Schön, Rodgau; Günther Wulff, Hoisdorf; Karl Hintermeier, Frankfurt am Main; Günther Wulff, Hoisdorf, and Karl Hintermeier, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 371,070, Apr. 23, 1982, abandoned. This application Mar. 5, 1984, Ser. No. 586,108

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125615

Int. Cl.³ B32B 27/10; C08L 67/02

U.S. Cl. 428—481 12 Claims

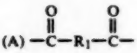
1. Modified aminoplast resin comprising

(a) 85 to 97.5% by weight of an aminoplast precondensate which has been etherified with a lower alkanol to an extent not exceeding 10% and

(b) 2.5 to 15% by weight of a modifying agent which comprises a mixture of:

(i) a water-soluble polyester prepared from carboxylic acids with at least one carboxyl and an alcohol with at least two hydroxyls, and

(ii) sufficient free diol or polyol whereby the mixture has a ratio of the sum of free and esterified hydroxyls of 0.8 to 4.5 moles for each mole of the sum of free and esterified carboxyls, wherein the polyester of said modifying agent is a polyester comprising structural units selected from the formula:



(A)

and

(B)

wherein

R_1 is a divalent hydrocarbyl moiety,

R_2 is divalent moiety having as a statistical average, 40–100 mole % of structural units of the formula $CH_2—CH_2—O—CH_2CH_2—$, $CH_2—CH_2—O—CH_2CH_2—O—CH_2CH_2—$ or mixtures thereof,

and said polyester has an acid number of 15 to 150.

4,535,032

BLACK-METALLIZED SUBSTRATE SURFACES

Kirkor Sirinyan; Rudolf Merten, both of Leverkusen, and Henning Giesecke, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 5, 1983, Ser. No. 539,034

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239090

Int. Cl.³ C23C 3/02; C23F 5/02; F24J 3/02

U.S. Cl. 428—629 8 Claims

1. Sheet-like substrate surfaces having a 0.01 to 2 μm thick black metal coat consisting essentially of metallic Co, Cu, Ni, Fe, Ag, Au and mixtures thereof and having a reflection of at most 20% of electromagnetic radiation within the wavelength range from 200 to 5,000 nm and at least 50% within the wavelength range from 7,000 to 24,000 nm, the percentages relating to the mean value over the entire respective wavelength range said black metal coat obtained by utilizing a metallizing bath containing a polymeric organic surface-active compound having a molecular weight of at least 400 and being completely or partially swellable in aqueous media, said polymers being in the form of latices or emulsions based on styrene-butadiene or acrylonitrile graft polymers or copolymers, polyisoprene,

homopolymers or copolymers, polyacrylates, polyvinyl chloride, polyvinyl acetate, polyurethane dispersions which are anionic, neutral or cationic or mixtures thereof.

4,535,033

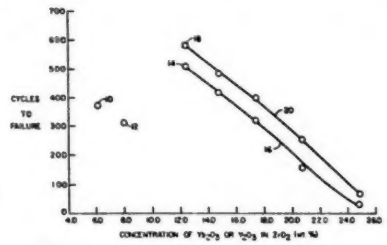
THERMAL BARRIER COATING SYSTEM

Stephan Stecura, Parma, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 523,297, Aug. 16, 1983, Pat. No. 4,485,151, and a continuation-in-part of Ser. No. 375,784, May 6, 1982, abandoned. This application Aug. 14, 1984, Ser. No. 640,712

Int. Cl.³ C23C 7/00; C23D 5/00; B32B 15/04

U.S. Cl. 428—633 10 Claims



1. A coated article of manufacture having a duplex thermal barrier coating system comprising

a substrate of a metal selected from the group consisting of nickel-base, cobalt-base, and iron-base alloys,

a bond coating covering said substrate, said bond coating consisting essentially of an alloy containing chromium, aluminum, a rare earth selected from the group consisting of yttrium and ytterbium with a metal selected from the group consisting of nickel, cobalt, and iron, and

a thermal barrier coating covering said bond coating, said thermal barrier coating consisting essentially of zirconia partially stabilized with ytterbia.

4,535,034

HIGH AL HEAT-RESISTANT ALLOY STEELS HAVING AL COATING THEREON

Takashi Zaizen; Yasuo Otoguro; Mikio Yamanaka, all of Kanagawa, and Shozo Yamane, Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 30, 1983, Ser. No. 567,343

Int. Cl.³ C23C 1/08

U.S. Cl. 428—653 12 Claims

1. A high-Al heat resistant coated steel comprising a base steel consisting essentially of, in weight percent, not more than 0.7% C, not more than 3.0% Si, not more than 2.0% Mn, 10 to 40% Ni, 9 to 30% Cr, 2 to 8% Al, with balance being Fe and unavoidable impurities, and an Al coating formed on the base steel.

4,535,035

OXIDATION RESISTANT SLURRY COATING FOR CARBON-BASED MATERIALS

James L. Smialek, and George C. Rybicki, both of Strongsville, Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 17, 1984, Ser. No. 571,617

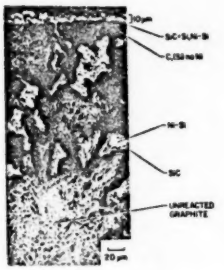
Int. Cl.³ B05D 3/02

U.S. Cl. 428—698 5 Claims

2. A method of coating a carbon-base material comprising the steps of

spraying a slurry containing nickel powders and silicon powders onto said carbon-base material in an air environment,

placing said slurry covered carbon-base material in a vacuum, and



sintering said slurry covered carbon-base material in said vacuum by heating the same to 1200° C. for one hour and then heating said slurry covered carbon-base material to 1325° C. for one hour.

5. A carbon-base material coated in accordance with the method of claim 2.

4,535,036

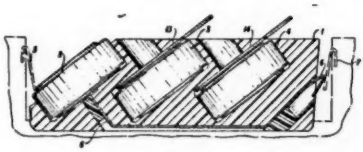
MULTI-CELL POWER SUPPLY

Roger W. Kelm, New Richmond, Wis.; Glenn W. Merry, St. Paul, and William J. McArthur, Maple Grove, both of Minn., assignors to Duracell Inc., Bethel, Conn.

Filed Jun. 4, 1984, Ser. No. 617,217

Int. Cl.³ H01M 2/10

U.S. Cl. 429—99 19 Claims



1. A portable electrical power source comprising housing means adapted to fit within a cell cavity of a battery-powered device, said housing means having positive and negative electrical contact means adapted to form electrical connection with corresponding positive and negative contact means of said device; a plurality of button cells releasably disposed within said housing means, at least one of said button cells being electrically connected to said contact means and at least 50 percent of said button cells being insulated from any electrical connection to said contact means and to the button cells electrically connected to said contact means.

4,535,037

LITHIUM-BORON ANODES IN NITRATE THERMAL BATTERY CELLS

George E. McManis, III; Aaron N. Fletcher, and Melvin H. Miles, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1984, Ser. No. 674,375

Int. Cl.³ H01M 4/36

U.S. Cl. 429—103 2 Claims

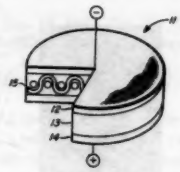
1. A thermally activated electrochemical cell, comprising:

a cathode;

BEST COPY AVAILABLE

an anode spaced from said cathode and made of a lithium-boron alloy; and

an electrolyte disposed between and in contact with said anode and said cathode, said electrolyte selected from the



group consisting of lithium nitrate, a mixture of lithium nitrate and sodium nitrate, a mixture of lithium nitrate and potassium nitrate, and a mixture of lithium nitrate and sodium nitrate with potassium nitrate.

4,535,038

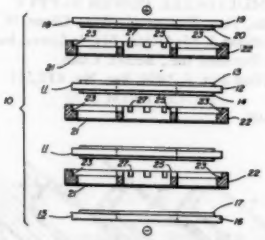
STRUCTURE FOR ELECTROCHEMICAL BATTERIES

Gerard H. Boyle, Concord; Roger K. Freeman, Boylston, and Franz Goebel, Sudbury, all of Mass., assignors to GTE Communications Products Corporation, Waltham, Mass.

Filed May 21, 1984, Ser. No. 612,222

Int. Cl.³ H01M *2/02*

U.S. Cl. 429—154 **2 Claims**



1. A structure for electrochemical batteries having a plurality of plates, comprised of:

a first fusible frame sized to overlap the outer periphery of one of said plates; and

a sheet of porous, electrically insulating material affixed to said first fusible frame wherein said sheet defines an inner hole and which further includes a second fusible frame sized to over lap the hole periphery, said sheet affixed to said second fusible frame.

4,535,039

BATTERY OR ELECTROCHEMICAL STORE BASED ON ELECTROCHEMICALLY OXIDIZABLE AND/OR REDUCIBLE POLYMERS

Herbert Naarmann, Wattenheim, and Gernot Koehler, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 29, 1983, Ser. No. 555,983

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244900

Int. Cl.³ H01M *6/18*

U.S. Cl. 429—213 **19 Claims**

1. A battery or electrochemical store comprising one or more cathodes, one or more anodes and one or more media for current transport within the battery or electrochemical store, wherein the active material of the cathode and/or anode consists of one or more electrically conductive polymers which have an electrical conductivity greater than 10^{-2} Ohm^{-1} cm^{-1} and contain electrochemically oxidizable and/or reducible redox groups which have a defined structure and are capable of forming two or more stable oxidation states.

4,535,040

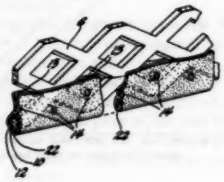
BATTERY GRID

Richard H. Kline, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 344,130, Jan. 29, 1982, abandoned, which is a continuation of Ser. No. 179,806, Aug. 20, 1980, abandoned. This application Dec. 27, 1983, Ser. No. 565,394

Int. Cl.³ H01M *4/74*

U.S. Cl. 429—234 **2 Claims**



1. A substantially planar grid for supporting the active material of an electric storage battery comprising: a conductive current collecting header along a first edge of said grid; a network of conductive wires extending from said header throughout the major extent of said grid, said wires defining a plurality of interstices for receiving said active material and forming a scalloped second edge opposite said first edge; a thin, flexible, thermoplastic ribbon enclosing said scalloped edge, said ribbon being folded lengthwise about said scalloped edge so as to provide a longitudinal crease in said ribbon extending along the periphery of the grid opposite said header and two wing-like ribbon portions diverging from said crease on opposite sides of said network and sandwiching said scalloped edge therebetween; and a plurality of spot welds in said ribbon portions and extending through said interstices along said second edge for joining said portions one to the other therethrough and thereby securing said folded ribbon to said scalloped edge.

4,535,041

STABILIZATION OF HOLOGRAMS

Herbert L. Fielding, Wilmington, and Richard T. Ingwall, Newton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 20, 1984, Ser. No. 641,994

Int. Cl.³ G03H *1/04*; G03C *5/24*

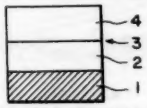
U.S. Cl. 430—1 **10 Claims**

1. A volume phase hologram comprising a polymerized ethylenic unsaturated monomer and the reaction product of zirconium with a fatty acid, said reaction product being present in said hologram in a concentration effective to increase the resistance of the hologram to changes induced by exposure to high humidity.

4,535,042
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER WITH ELECTRON DONOR AND ACCEPTOR LAYERS

Hiroyuki Kitayama, and Toyoko Kobayashi, both of c/o Canon Kabushiki Kaisha, 30-2, 3-chome, Shimomaruko, Ohta-ku, Tokyo, Japan

Filed Feb. 21, 1984, Ser. No. 581,902
Claims priority, application Japan, Feb. 24, 1983, 58-28480; Feb. 24, 1983, 58-28481
Int. Cl.[3] G03G 5/06
U.S. Cl. 430—56 9 Claims



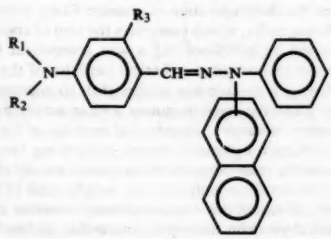
1. An electrophotographic photosensititve member constructed with a layer comprising a low molecular electron acceptor and a resin, and a layer comprising a low molecular hydrazone compound electron donor, and a resin both layers being supported by an electrically conductive substrate with themselves superposed upon each other to form a thin layer of charge transfer complex at the interface between the two layers.

4,535,043
ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Shozo Ishikawa, Yokohama; Hitoshi Toma, Kawasaki, and Fumio Sumino, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1984, Ser. No. 605,839
Claims priority, application Japan, May 9, 1983, 58-81105
Int. Cl.[3] G03G 5/14
U.S. Cl. 430—58 8 Claims

1. An electrophotographic photosensitive member having a photosensitive layer of a laminate structure comprising a charge generation layer and a charge transport layer on a conductive substrate, characterized in that the charge generation layer contains an aluminum chloride phthalocyanine pigment and the charge transport layer contains a hydrazone compound represented by the general formula



(1)

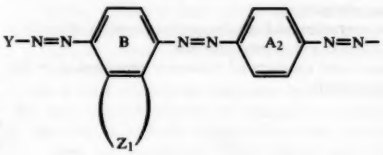
wherein, R_1 and R_2 represent alkyls or are residues forming a cyclic amino group together with the nitrogen atom which links them, and R_3 represents hydrogen or halogen.

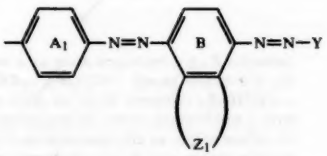
4,535,044
PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY CONTAINING PHOTOSENSITIVE LAYER INCORPORATING PENTAKISAZO PIGMENT

Teruaki Higashiguchi, Tokyo, and Nobuhiro Miyakawa, Abiko, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

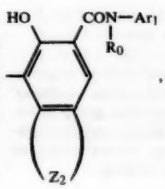
Filed May 9, 1983, Ser. No. 492,959
Claims priority, application Japan, May 10, 1982, 57-76497
Int. Cl.[3] G03G 5/06, 5/10
U.S. Cl. 430—58 14 Claims

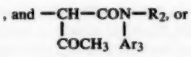
1. A photosensitive material for electrophotography, which comprises a photosensitive layer containing as a charge-generating pigment a pentakisazo pigment represented by the following formula:

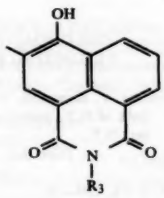




wherein the rings A_1 and A_2 may have halogen atoms, alkyl groups or alkoxy groups as substitutents at the ortho-positions to the azo groups, the ring B may have a halogen atom, an alkyl group or an alkoxy group as a substituent or may contain the ring Z_1, Z_1 selected from the group consisting of an aromatic or hetero ring fused to the benzene ring B, or a substituted derivative thereof and Y stands for a group selected from a group represented by the following formula:



, and 



in which Z_2 is an aromatic ring, a carbozole ring or a benzofuran ring or a substituted derivative thereof, Ar_1 is an aromatic ring, a hetero ring or a substituted derivative thereof, Ar_2 and Ar_3 is an aromatic ring or a substituted derivative thereof, R_0 is a hydrogen atom, a lower alkyl group or a phenyl group, R_1 is a lower alkyl group, a carboxyl group or an ester thereof,

and R_2 and R_3 is a hydrogen atom, a lower alkyl group, a phenyl group or a substituted derivative thereof.

4,535,045

ELECTRIC LIGHT-SENSITIVE MATERIAL CONTAINING A NOVEL VINYLIDENE CHLORIDE COPOLYMER

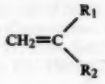
Kouichi Kawamura; Seiji Horie, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 4, 1983, Ser. No. 548,813
Claims priority, application Japan, Nov. 5, 1982, 57-194199
Int. Cl.³ G03G 5/05
U.S. Cl. 430—60 **9 Claims**

1. An electrophotographic light-sensitive material comprising an electrically conductive support and a light-sensitive layer on the support, wherein the light-sensitive layer contains a copolymer comprising:

(a) a monomer selected from the group consisting of a vinylidene chloride and a vinyl chloride;

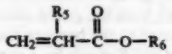
(b) a vinyl-based unsaturated monomer represented by the general formula;



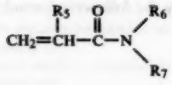
I

(wherein R_1 is a hydrogen atom or a methyl group, and R_2 is a cyano group, $-COOR_3$, $-OCOR_3$, $-OR_3$ or $-CONR_3R_4$ (wherein R_3 is an alkyl group containing from 1 to 15 carbon atoms, an aryl group containing up to 15 carbon atoms, an allyl group, a vinyl group, or a heterocyclic group, and R_4 is a hydrogen atom or an alkyl group containing from 1 to 15 carbon atoms)); and

(c) a vinyl monomer containing a hydroxyl group at the side chain thereof represented by the general formulas II and



II



III

wherein R_5 represents a hydrogen atom or an alkyl group, R_6 represents an alkyl group, an aryl group, an aralkyl group or a substituted group of them, the group represented by R_6 containing a hydroxyl group, and R_7 represents a hydrogen atom, an alkyl group, an aryl group, an aralkyl group or a substituted group of them.

4,535,046

CHLOROALUMINUMPHTHALOCYANINE EXHIBITING REDUCED GREEN SPECTRAL ABSORPTION

Henry V. Ksaacson, Webster, and Hal E. Wright, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,536
Int. Cl.³ G03G 5/06
U.S. Cl. 430—78 **4 Claims**

1. Chloroaluminumphthalocyanine which, when formed into composite particles and dispersed into Isopar G™, as described in Example 1 herein, and the resulting dispersion is coated on a reflective support as described in Example 2 herein, exhibits a spectral absorption peak of 1.0 normalized absorption unit at about 640 nm and an absorption of no greater than 0.7 normalized absorption unit at 600 namometers.

4,535,047

FERROMAGNETIC AMORPHOUS METAL CARRIER PARTICLES FOR ELECTROPHOTOGRAPHIC TONERS

Lewis J. Colby, Jr., Short Hills, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 4, 1983, Ser. No. 482,097
Int. Cl.³ G03G 9/14
U.S. Cl. 430—108 **10 Claims**

1. An improved two component electrophotographic developer consisting essentially of a toner and a magnetic carrier particle, the improvement comprising:

said development carrier comprising a flat polyhedral shaped particle of a ferromagnetic amorphous metal.

4,535,048

TONER FOR DEVELOPMENT OF ELECTROSTATIC CHARGES

Sukejiro Inoue, Yokohama; Masumi Sasakawa, Tokyo; Hiroshi Fukumoto, and Shinji Doi, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,576
Claims priority, application Japan, Aug. 12, 1982, 57-140241
Int. Cl.³ G03G 9/08, 9/14
U.S. Cl. 430—110 **9 Claims**

1. A toner for the development of electrostatic charges, comprising a salicylic acid metal complex and an amorphous polyester having an acid value of from 10 to 100 prepared by the reaction of (1) at least one etherified diphenol with (2) an acid component, said diphenol being propoxylated, or propoxylated and ethoxylated wherein the propoxy group content is not less than 50 mole % of the total of the propoxy and ethoxy groups, said acid component comprising (a) at least one phthalic acid or a reactive derivative thereof and (b) at least one trivalent or higher valent aromatic carboxylic acid wherein (b) is in an amount of not more than 40 mole % based on the total amount of said acid component, and wherein the amount of the salicylic acid metal complex is at least 0.2% by weight based on the polyester.

4,535,049

PRESSURE-FIXING TONER FOR ELECTROPHOTOGRAPHY AND PROCESS FOR PREPARATION THEREOF

Nobuyasu Honda, Tenri; Toshiro Yamakawa, Osaka, and Toshimitsu Ikeda, Himeji, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 2, 1983, Ser. No. 519,594
Claims priority, application Japan, Aug. 4, 1982, 57-135134
Int. Cl.³ G03G 9/08
U.S. Cl. 430—137 **4 Claims**

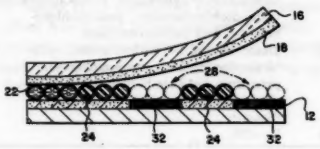
1. A process for the preparation of pressure-fixing toners for the electrophotography, which comprises the step of cooling a solution obtained by hot-dissolving a wax component in an aromatic solvent to precipitate spherical particles of the wax component having a particle size smaller than 10 microns and copolymerizing a styrene type monomer with an acrylic monomer in the system containing the spherical particles of the wax component to form a composite binder comprising the wax component and the resin component composed mainly of the resulting styrene-acrylic copolymer at a weight ratio of from 54/46 to 20/80, in which the wax component is present in the form of spherical particles having a particle size smaller than 10 microns in a continuous phase of the resin component, and the step of kneading the composite binder with a pigment, and cooling and pulverizing the kneaded composite binder and pigment to form particles having an indeterminate shape.

4,535,050

PEELING DEVELOPMENT OF PHOTOSENSITIVE MATERIALS EMPLOYING MICROENCAPSULATED RADIATION SENSITIVE COMPOSITIONS

Paul C. Adair, and David G. Adkins, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Jul. 18, 1983, Ser. No. 514,397
Int. Cl.³ G03C 1/40, 1/68, 1/495
U.S. Cl. 430—138 **27 Claims**



1. An imaging sheet comprising:
a support,
a layer of microcapsules on said support,
said microcapsules containing an internal phase including a radiation sensitive composition which undergoes a change in viscosity upon exposure to actinic radiation and an image-forming agent, and
a strippable cover sheet formed from a material transparaent to said actinic radiation,
said cover sheet being uniformly adhered to said layer of microcapsules prior to exposure, wherein said imaging sheet is useful in forming images by image-wise exposing said imaging sheet to actinic radiation and separating said cover sheet from said layer of microcapsules, whereby said microcapsules rupture and image-wise release said image-forming agent.

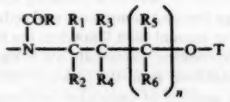
4,535,051

PHOTOGRAPHIC PRODUCTS AND PROCESSES WITH COLOR SHIFTED DYE

Myron S. Simon, West Newton, and David P. Waller, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 27, 1984, Ser. No. 644,915
Int. Cl.³ G03C 5/54, 1/40
U.S. Cl. 430—222 **21 Claims**

8. A photographic product comprising a photosensitive element comprising a plurality of layers including a support, a silver halide emulsion in a layer on said support, and in a layer on the same side of said support as said silver halide emulsion, a color shifted precursor of a preformed image dye, said color shifted precursor having at least one



group, wherein R is hydrogen, alkyl, provided that the α-carbon is not attached to a hydrogen atom, or aryl; R_1, R_2, R_3, R_4, R_5 and R_6 are each independently hydrogen, alkyl or aryl; n is 0 or 1, and T is a moiety containing a thiazolidin-2-yl group, said thiazolidin-2-yl group being capable of undergoing cleavage in the presence of silver ions and/or soluble silver comlplex, said moiety maintaining said color shifted precursor in its color shifted form at least until said thiazolidin-2-yl group undergoes said cleavage.

11. A photographic product as defined in claim 8 wherein said image dye provided by said color shifted precursor is diffusible in aqueous alkaline solution and further including an image receiving layer so positioned as to be capable of receiving by diffusion an imagewise distribution of said image dye.

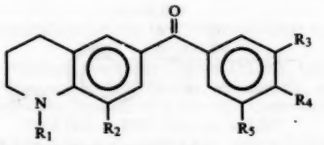
4,535,052

CONSTRAINED N-ALKYLAMINO ARYL KETONES AS SENSITIZERS FOR PHOTOPOLYMER COMPOSITIONS

Albert G. Anderson, and Thomas E. Dueber, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 490,956, May 2, 1983, abandoned. This application Aug. 28, 1984, Ser. No. 645,115
Int. Cl.³ G03C 1/94, 1/68
U.S. Cl. 430—277 **10 Claims**

1. A photopolymerizable composition comprising an admixture of
(a) at least one nongaseous ethylenically unsaturated compound having at least one terminal ethylenically unsaturated group, a boiling point above 100° C. at normal atmospheric pressure and being capable of addition polymerization.
(b) at least one organic polymeric binder compound,
the improvement wherein the composition contains
(c) 0.001 to 15% by weight of the total composition of at least one constrained N-alkylamino aryl ketone of the formula:



R_1 is lower alkyl of 1 to 4 carbons;
R_2 is H or taken together with R_1 is $—CH_2CH_2CH_2—$;
R_4 is H, $—OCH_3$ or

R_6 and R_7 are lower alkyl of 1 to 4 carbon atoms;
R_3 is H or taken together with R_6 is $—CH_2CH_2CH_2—$;
R_5 is H or taken together with R_7 is $—CH_2CH_2CH_2—$.

9. A photopolymerizable element comprising a support bearing a layer of a composition according to claim 1.

10. A photopolymerizable element according to claim 9 wherein the support is copper.

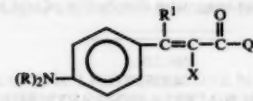
4,535,053

MULTILAYER PHOTORESIST PROCESS UTILIZING CINNAMIC ACID DERIVATIVES AS ABSORBANT DYES

Paul R. West, Clifton Park, and Bruce F. Griffing, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

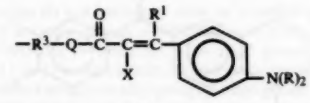
Filed Jun. 11, 1984, Ser. No. 619,526
Int. Cl.³ G03F 7/02; G03C 1/76
U.S. Cl. 430—312 **1 Claim**

1. A process for photopatterning a polymethylmethacrylate resist on a silicon substrate which comprises
(1) spin casting onto a silicon substrate, a polymethylmethacrylate resin composition comprising
(A) 100 parts of an inert organic solvent
(B) 1 to 15 parts of a polymethylmethacrylate and
(C) 0.01 to 1.0 parts of a cinnamic acid derivative included within the formula



(2) baking the applied resist composition of (1) to a temperature of 100° to 200° C. to produce a polymethylmethacrylate resist layer having a thickness of from 1 to 3 microns,
(3) applying onto the layer of (2) a polynovolak resist to a thickness of from about 0.2 to 1.0 microns,
(4) baking the resist layer of (3) to a temperature of 140° to 200° C.,
(5) exposing the upper resist layer of (4) to patterned UV light at about 350 to 440 nm to produce a latent positive image in the resist,
(6) developing the resist of (7) and thereafter baking the resulting portable conformable mask,
(7) exposing the composite of the portable conformable mask and the polymethylmethacrylate resist layer to UV light in the range of 190 to 250 nm to produce a positive image of the portable conformable mask, and
(8) developing the resulting polymethylmethacrylate resist,

where R and R^1 are selected from hydrogen or $C_{(1-8)}$ alkyl, Q is —O— or —N—, X is selected from nitrile and halogen, R^2 is a monovalent group selected from



polyalkylene glycol, polyalkylene amine and polyalkylene ester and R^3 is a $C_{(1-8)}$ alkylene radical or $C_{(6-13)}$ aryl radial.

4,535,054

WET PROCESS FOR DEVELOPING STYRENE POLYMER RESISTS FOR SUBMICRON LITHOGRAPHY

Robert G. Brault, Santa Monica, and Leroy J. Miller, Canoga Park, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed May 5, 1983, Ser. No. 491,636
Int. Cl.³ G03C 5/16
U.S. Cl. 430—325 **24 Claims**

1. A lithographic process for preparing a patterned resist on a substrate, which process comprises:
(1) applying a layer of negative resist polymer onto a substrate, said polymer being selected from the group consisting of:
(a) polystyrene
(b) halogenated polystyrene, and
(c) substituted styrene polymer having at least one substituent, where said at least one substituent is independently selected from the group consisting of alkyl having 1–4 carbon atoms; halo; haloalkyl having 1–4 carbon atoms and at least one halo, and
(d) mixtures thereof;
(2) irradiating said resist polymer layer to form a negative pattern image therein; and
(3) developing said image by
(i) dissolving away unexposed polymer with a developer solvent, and
(ii) rinsing said wet developed resist with a nonsolvent to eliminate substantially any snakiness of the developed resist pattern image;

where said developer solvent/rinse nonsolvent combination is selected from the following schedule, wherein (d/s) is the developer solvent and (r/ns) is rinse nonsolvent:

Schedule 1

I. (d/s)	R_2—$(OCH_2CH_2)_m$—O—H
(r/ns)	R_5—$(OCH_2CH_2)_m$—OH or R—OH
II. (d/s)	R_7—$(OCH_2CH_2)_m$—O—R_7
(r/ns)	R_5—$(OCH_2CH_2)_m$—OH or R—OH
III. (d/s)	R—CO—$(OCH_2CH_2)_p$—O—$(OC)_{0-1}$—R
(r/ns)	R_5—$(OCH_2CH_2)_m$—OH or R—OH
IV. (d/s)	benzene, toluene, ethylbenzene, xylene, monochlorobenzene, monochlorotoluene, monochloroethylbenzene, monochloroxylene, ortho-dichlorobenzene, meta-dichlorobenzene, and trichlorobenzene
(r/ns)	alkane having 5–8 carbon atoms, cycloalkane having 5–8 carbon atoms, and petroleum distillate boiling in the 5–8 alkane carbon atom boiling range
V. (d/s)	dioxane
(r/ns)	R—OH

where:
R is alkyl having 1–4 carbon atoms,
R_2 is alkyl having 4–8 carbon atoms,
R_5 is H, methyl, or ethyl,
R_7 is alkyl having 1–8 carbon atoms,
m is an integer equal to 1–4, and
p is an integer equal to 1–2.

4,535,055

SELF-FIXING IMAGING FILM CONTAINING REDUCTANT PRECURSOR

Terry T. Yu, Mt. Clemens, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 402,120, Jul. 26, 1982, abandoned. This application May 18, 1984, Ser. No. 612,001
Int. Cl.³ G03C 5/24
U.S. Cl. 430—353 **15 Claims**

1. A method for recording electromagnetic radiation in which a fixed image is provided wherein said method comprises imagewise impinging said radiation upon a photosensitive film to produce a change in at least one property thereof, said film being made from a film-forming composition, which composition comprises:
(a) a reducible image forming compound;
(b) a reductant precursor which will abstract labile hydrogen from a labile hydrogen source under the influence of imaging energy to become a reducing agent with respect to the image forming compound, said reductant precursor present in an amount such that when the film is developed normally by heating, essentially all of the reductant precursor is removed from the film and the film is thereby fixed, said amount of reductant precursor being in the range of from 0.5% to 3.0% by weight of the total film-forming composition;
(c) a source of labile hydrogen for reaction with said reductant precursor; and
(d) a matrix in which said reducible image forming compound, reductant precursor and source of labile hydrogen are combined in amounts effective to form a composition which may be applied to a substrate,

said method further comprising subjecting the film after said impinging to normal development by heating for a period of time sufficient to develop and fix the film by removing essentially all of the reductant precursor.

4,535,056

YELLOW COLOR FORMERS FOR USE IN COLOR PHOTOTHERMOGRAPHIC SYSTEM

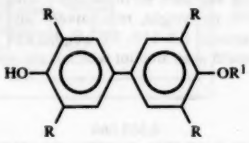
Robert A. Frenchik, Somerset Township, St. Croix County, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 15, 1984, Ser. No. 590,485
Int. Cl.[3] G03C *1/02*
U.S. Cl. 430—542 16 Claims

1. A photographic construction comprising at least one polymeric binder layer containing spectrally-sensitized photographic silver halide and, in association therewith

a. a non-light sensitive organic silver salt oxidizing agent,

b. at least one biphenol color-forming reducing agent having the formula



wherein each R is independently selected from a straight chain or branched alkyl or alkoxy group having 1 to 6 carbon atoms, and phenyl, and R^1 is hydrogen or an alkali-labile protecting group, and

c. at least one aliphatic or aromatic carboxylic acid as development modifier, the acid having the formula

$$R(COOH)_x$$

wherein

x is an integer having the value 1 or 2,

R is a group which is unsubstituted or substituted by at least one group selected from amino, hydroxyl, lower alkyl (C_1 to C_4), nitro, and one or two chloro atoms, wherein

when x is 1,

R is selected from the group consisting of alkenyl, aryl, and phenylalkyl, having up to 10 carbon atoms, and

when x is 2,

R is selected from the group consisting of alkenylene, alkylene, and arylene, having up to 14 carbon atoms; and

d. optionally, at least one toner; said polymeric binder layer being capable of providing a yellow to gold color upon development.

4,535,057

IMMUNOASSAY EMPLOYING MONOCLONAL HERPES SIMPLEX ANTIBODY AND BIOTIN-AVIDIN DETECTION SYSTEM

Gordon R. Dreesman, Houston, Tex., and Cynthia E. Kendall, Colombia, Mo., assignors to AMF Incorporated, White Plains, N.Y.

Filed Jul. 26, 1982, Ser. No. 402,009
Int. Cl.[3] G01N *33/54*
U.S. Cl. 435—5 18 Claims

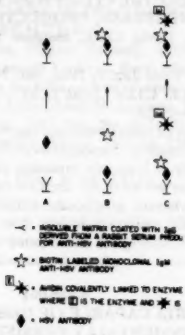
1. An immunoassay which comprises:

a. forming an insoluble matrix comprising IgG antibody against a virus antigen to be detected;

b. contacting said matrix with a biological fluid to immunocapture the virus antigen sought to be detected;

c. contacting the resultant matrix with a biotin labeled monoclonal IgM antibody against said virus antigen;

d. contacting the resultant matrix with readably labeled avidin; and


A
B
C
INSOLUBLE MATRIX COATED WITH IgG DERIVED FROM A RABBIT SERUM PREPD. FOR ANTI-HSV ANTIBODY
BIOTIN LABELED MONOCLONAL IgM ANTI-HSV ANTIBODY
AVIDIN COVALENTLY LINKED TO ENZYME
WHERE E IS THE ENZYME AND ✱ IS
HSV ANTIBODY

e. determining the presence of and/or quantifying the immunocaptured virus antigen from the biological fluid by reading the labeled avidin immunocaptured by the matrix.

4,535,058

CHARACTERIZATION OF ONCOGENES AND ASSAYS BASED THEREON

Robert A. Weinberg, Brookline; Clifford J. Tabin, Cambridge, both of Mass., and Scott M. Bradley, McLean, Va., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 1, 1982, Ser. No. 432,337
Int. Cl.[3] C12Q *1/68, 1/48, 1/34;* C12P *19/34;* C12N *15/00;* G01N *15/02;* C07H *21/04;* A61K *43/00*
U.S. Cl. 435—6 16 Claims

1. In an assay for detecting the mutation of a proto-oncogene to an oncogene:

the improvement comprising digesting the proto-oncogene or the oncogene with a restriction enzyme specific for a cleavage site present only in either said proto-oncogene or said oncogene.

4,535,059

MUCONIC ACID PRODUCTIVITY BY A STABILIZED MUTANT MICROORGANISM POPULATION

Jih-Han Hsieh, Parsippany; Sol J. Barer, Fanwood, and Peter C. Maxwell, New Providence, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 13, 1983, Ser. No. 457,807
Int. Cl.[3] C12P *7/40, 7/44;* C12N *9/02, 9/04, 1/26, 1/20, 1/28;* C12M *1/36*
U.S. Cl. 435—142 5 Claims

1. In a fermentation process for the production of muconic acid involving the culturing of a mutant Pseudomonad having the identifying characteristics of *Pseudomonas putida* ATCC No. 31,916 under conditions permitting the formation of muconic acid and recovery of muconic acid wherein the improvement comprises: limiting the presence of essential phosphate nutrient within a phosphate: growth carbon weight ratio range between about 0.04–0.08:1 in the aqueous fermentation medium which is maintained at a pH between about 5 to 8; thereby (1) increasing the specific muconic acid productivity of the microorganism, and (2) stabilizing the microorganism population whereby cell reversion is suppressed, wherein said suppressed cell reversion is to a parent strain of the microorganism which has the ability to grow on a non-growth toluene carbon source.

4,535,060

INHIBITION RESISTANT 5-ENOLPYRUVYL-3-PHOSPHOSHIKIMATE SYNTHETASE, PRODUCTION AND USE

Luca Comai, Davis, Calif., assignor to Calgene, Inc., Davis, Calif.

Filed Jan. 5, 1983, Ser. No. 455,634
Int. Cl.³ C12N *15/00, 1/20, 1/00;* C12P *19/34*
U.S. Cl. 435—172.3 8 Claims

1. A culture of cells consisting essentially of cells containing glyphosate resistant 5-enolpyruvyl-3-phosphoshikimate synthetase having at least one mutation originating from in vitro mutation in the aro locus for the structural gene expressing said synthetase, wherein glyphosate inhibition of said synthetase containing said mutation is less than about one-half of the synthetase of the original strain prior to mutation.

4,535,061

BACTERIA CAPABLE OF DISSIMILATION OF ENVIRONMENTALLY PERSISTENT CHEMICAL COMPOUNDS

Ananda M. Chakrabarty, Villa Park, Ill., and Scott T. Kellogg, Gaithersburg, Md., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Dec. 28, 1981, Ser. No. 334,519
Int. Cl.³ C12N *1/20, 15/00;* C02F *3/00*
U.S. Cl. 435—253 2 Claims

1. *Pseudomonas cepacia* strain A.T.C.C. 39027.

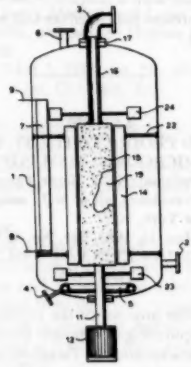
2. A mixed culture of Pseudomonas and Arthrobacter, A.T.C.C. No. 39028.

4,535,062

APPARATUS FOR GROWING MICROORGANISMS

Hans Müller, Erlenbach, Switzerland, assignor to Chemap AG, Männedorf, Switzerland

Filed Feb. 7, 1983, Ser. No. 464,742
Claims priority, application Switzerland, Feb. 12, 1982, 965/82
Int. Cl.³ C12M *1/36*
U.S. Cl. 435—289 16 Claims



1. An apparatus for growing micro-organisms, comprising:

a fermenter accommodating a suspension of micro-organisms in a medium for fermentation and growing micro-organisms;

a diaphragm filter arranged in the interior of said fermenter for separating and withdrawing products of metabolism, said diaphragm filter having an axis and an axially extending peripheral surface radially spaced from said axis; and

stirring means arranged in the interior of said fermenter between the diaphragm filter and wall of the fermenter for stirring the suspension, said stirring means being located radially outwardly of and immediately near to said peripheral surface of said diaphragm filter and extending axially along said peripheral surface.

4,535,063

SILICON NITRIDE SINTERED BODIES AND A METHOD FOR PRODUCING THE SAME

Keiji Matsuhiro, and Minoru Matsui, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 7, 1983, Ser. No. 501,824
Claims priority, application Japan, Feb. 9, 1983, 58-18963
Int. Cl.³ C04B *35/58*
U.S. Cl. 501—97 13 Claims

1. Silicon nitride sintered bodies consisting of oxides or oxynitrides of each element of Sr, Mg, a rare earth element and Zr, said Sr, Mg and rare earth element being present in an amount 0.1–15% by weight, respectively, and said Zr being present in an amount 0.1–11% by weight, and the remainder being Si_3N_4 present in an amount which is not less than 70% by weight.

4,535,064

CERAMIC COMPOSITIONS FOR A REDUCTION-REOXIDATION TYPE SEMICONDUCTING CAPACITOR

Yasunobu Yoneda, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed May 24, 1984, Ser. No. 613,628
Claims priority, application Japan, May 25, 1983, 58-93095; May 25, 1983, 58-93097; Jul. 11, 1983, 58-126500
Int. Cl.³ C04B *35/46*
U.S. Cl. 501—138 4 Claims

1. A ceramic composition for a reduction-reoxidation type semiconducting capacitor, said composition comprising (1) a mixture of 79.0 to 98.0 mole % barium titanate, 1.0 to 6.0 mole % cerium oxide and 1.0 to 15.0 mole % zirconium oxide and (2) 0.01 to 0.4% by weight manganese oxide, calculated as Mn based on the weight of said mixture (1).

4. A ceramic composition for a reduction-reoxidation type semiconducting capacitor, said composition comprising (1) a mixture of 79.0 to 99.0 mole % barium titanate, 0.5 to 6.0 mole % of an oxide of at least one lanthanide having an atomic number of from 59 to 66 and 0.5 to 15.0 mole % zirconium oxide, and (2) 0.01 to 0.4% by weight manganese oxide, calculated as Mn based on the weight of said mixture (1).

4,535,065

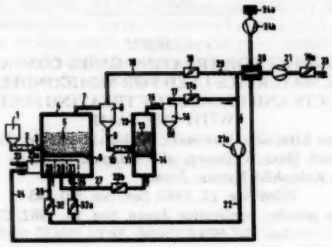
METHOD FOR REGENERATION OF MOIST POWDER ADSORPTION AGENTS

Jürgen Klein, and Peter Schulz, both of Essen, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 421,111
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3139078
Int. Cl.³ B01J *20/34;* C01B *31/10, 31/08;* C10J *3/54*
U.S. Cl. 502—21 4 Claims

1. A method of regeneration of moist powder activated carbon, comprising the steps of mixing a moist powder activated carbon with a sewage sludge to obtain a mixture; feeding said mixture into a first fluidized bed filled with a heat-carrying solid material; introducing hot gases into said first fluidized bed below said solid material; drying said mixture while it is fed by said hot gases upwardly in said first fluidized bed through said solid material; withdrawing the dried mixture together with the hot gases from said first fluidized bed at a region thereof above said solid material; separating the dried mixture from the hot gases in a first gas separator; separating the dried sludge from the dried activated carbon; feeding said dried activated carbon into a second fluidized bed filled with a heat-carrying solid material; introducing hot gases into said second fluidized

bed below said solid material; regenerating the activated carbon in said second fluidized bed while the activated carbon is fed by the hot gases upwardly through the heat-carrying solid material in said second fluidized bed; withdrawing activated carbon together with the gases from said second fluidized bed at a region thereof above said solid material; and separating the activated carbon from the gases in a second gas separator.



2. The method as defined in claim 1, wherein said heat-carrying solid material in said first fluidized bed and said second fluidized bed is sand.

3. The method as defined in claim 1, further including the step of obtaining a portion of the gases from said first separator and mixing said portion with the gases freshly introduced into said first fluidized bed.

4,535,066

PASSIVATING METALS ON CRACKING CATALYSTS

Harold W. Mark; Brent J. Bertus; John S. Roberts; Dwight L. McKay, all of Bartlesville, and Lyle E. Fenska, Edmond, all of Okla., assignors to Philips Petroleum Company, Bartlesville, Okla.

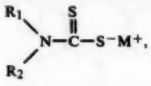
Division of Ser. No. 429,736, Sep. 30, 1982, Pat. No. 4,459,366. This application Mar. 2, 1984, Ser. No. 585,667

Int. Cl.³ B01J *29/06, 23/14, 33/00*

U.S. Cl. 502—62 **34 Claims**

1. A composition comprising a soluble salt of a dialkyldithiocarbamate that has been treated with a hydrolyzable germanium (IV) compound.

3. A composition in accordance with claim 1, wherein said salt of a dialkyldithiocarbamate has the general formula



where R_1 and R_2 are selected independently from aliphatic or alicyclic radicals, and M^+ is the cation of an alkali or alkaline earth metal, the ammonium ion, or a quaternary ammonium ion.

16. A cracking catalyst comprising materials selected from the group consisting of silica, silica-alumina and zeolites, further comprising antimony and a modifying composition prepared by treating a soluble salt of a dialkyldithiocarbamate with a hydrolyzable germanium (IV) compound in amounts effective to passivate contaminant metals deposited thereon.

27. A composition in accordance with claim 1 which is recovered in the liquid phase essentially free of germanium.

4,535,067

CATALYST CONTAINING IRON, CHROMIUM, POTASSIUM AND LANTHANUM OXIDES, ITS MANUFACTURE AND USE IN DEHYDROGENATION REACTIONS

Philippe Courty, Houilles; Michel Roussel, Antony; Philippe Varin, Massy; Jean-Francois Le Page, Rueil Malmaison, and Serge Leporq, Mantes la Ville, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 14, 1983, Ser. No. 561,376

Claims priority, application France, Dec. 14, 1982, 82 21085; Dec. 14, 1982, 82 21086

Int. Cl.³ B01J *21/16, 23/10*

U.S. Cl. 502—84 **13 Claims**

1. A catalyst comprising, as oxides, iron, chromium and potassium, the iron, chromium and potassium, calculated as oxides, being in proportion corresponding to ratios by weight:

$$\frac{FeO_3}{K_2O}$$

from 1/1 to 10/1

$$\frac{CrO_3}{K_2O}$$

from 0.05/1 to 0.4/1

$$\frac{Fe_2O_3}{CrO_3}$$

from 15/1 to 40/1,

characterized in that it also comprises, as oxide, lanthanum in a proportion, calculated as oxide, from 1 to 15% by weight with respect to the catalyst weight.

2. A catalyst according to claim 1, characterized in that it comprises kaliophyllite of the formula Al_2O_3, $2SiO_2$, K_2O and an excess of potassium with respect to that comprised in kaliophyllite, the kaliophyllite proportion being from 5 to 40% of the catalyst weight, the potassium excess being, in proportion to iron and chromium, in the following ratios by weight:

$$\frac{Fe_2O_3}{K_2O \text{ excess}} = 3/1 \text{ to } 10/1 \text{ and } \frac{CrO_3}{K_2O \text{ excess}} = 0.1/1 \text{ to } 4/1.$$

4,535,068

OLEFIN POLYMERIZATION CATALYST COMPOSITIONS AND POLYMERIZATION PROCESS

Robert C. Job, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 534,016, Sep. 20, 1983, abandoned. This application Oct. 5, 1984, Ser. No. 657,861

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—107 **27 Claims**

1. A method for producing an improved olefin polymerization catalyst component, which method comprises:

(a) halogenating a magnesium compound of the formula MgR′R″ where R′ is an alkoxide or aryloxide group and R″ is an alkoxide or aryloxide group or halogen, with a tetravalent titanium halide in the presence of a halohydrocarbon and an electron donor, therein forming a halogenated product;

(b) contacting said halogenated product with an acid halide of the formula

where A is an alkyl, aryl or substituted aryl group and X is a halide, said substituted aryl group having substituents on the benzene ring selected from the group consisting of halogens, C_1–C_6 alkyl groups and C_1–C_6 alkoxy groups, at a temperature of about 40° to about 140° C.;

(c) contacting the resulting acid halide-treated product with a tetravalent titanium halide at a temperature of about 40° to about 140° C.; and

(d) washing the resulting titanium halide-treated product with an inert hydrocarbon liquid.

4,535,069

CATALYST COMPONENT FOR α-OLEFIN POLYMERIZATION

Hiroshi Shimizu; Masaki Abe, and Akihiro Sato, all of Chibaken, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Feb. 16, 1983, Ser. No. 466,971

Claims priority, application Japan, Apr. 30, 1982, 57-72994

Int. Cl.³ C08F 4/64

U.S. Cl. 502—115 **13 Claims**

1. A catalyst component for α-olefin polymerization comprising a solid product (II) obtained by

reacting at least one member selected from the group consisting of magnesium compounds expressed by the general formula MgR^1R^2 (wherein R^1 represents alkyl, aryl, alkoxy or aryloxy group and R^2 represents alkyl, aryl, alkoxy, aryloxy group or halogen atom), with a complex compound of at 1 least one member selected from the group consisting of aluminum compounds expressed by the general formula $AlR_n^3X_{3-n}$ (wherein R_3 represents alkyl, aryl, alkoxy or aryloxy group, X represents a halogen atom and n represents a number of $0 \leqq n < 2$) with 2 esters of carboxylic acid to obtain a solid product (I); and

reacting this solid product (I) with a liquid halogen-containing titanium compound.

4,535,070

ACRYLAMIDE POLYMER USED TO REDUCE FINES IN ALUMINUM PHOSPHATE GEL

Max P. McDaniel; Marvin M. Johnson; Gil R. Hawley; John Westerman, and Paul D. Smith, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 23, 1983, Ser. No. 565,251

Int. Cl.³ B01J 27/14, 31/02; C01B 25/26

U.S. Cl. 502—208 **18 Claims**

1. A method of producing aluminum phosphate comprising as a first step combining an aluminum salt, a source of phosphate ions, and a water-soluble acrylamide polymer with neutralizing agent to form an aluminum phosphate hydrogel; and thereafter as a second step removing water from said hydrogel to form a zerogel.

4,535,071

CATALYST FOR METHANOL SYNTHESIS AND METHOD OF PREPARING THE CATALYST

Michael Schneider, Ottobrunn-Riemerling; Karel Kochloefl, Moosburg, and Jürgen Ladebeck, Landshut, all of Fed. Rep. of Germany, assignors to Süd Chemie Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,745

Claims priority, application Fed. Rep. of Germany, May 16, 1983, 3317725

Int. Cl.³ B01J 21/04, 23/06, 23/72

U.S. Cl. 502—342 **28 Claims**

1. A catalyst, selective for the synthesis of methanol, which comprises:

A. a major portion by weight of the oxides of copper and zinc;

B. a minor portion by weight of aluminum oxide;

C. in which the pore distribution of the finished catalyst is as follows:

1. pores with a diameter in the range of 20–75 Å, constituting at least 20% and

2. pores with a diameter greater than 75 Å, constituting no more than 80% of the catalyst.

4,535,072

ABSORBENT FOR TREATING GASES CONTAINING THE MATERIALS USED FOR SEMICONDUCTOR PRODUCTS AND PROCESS OF TREATING SUCH GASES WITH THE SAME

Masayasu Kitayama, Kawasaki; Yoshiaki Sugimori, Tokyo, and Schunich Ohta, Fujisawa, all of Japan, assignors to Nihon Sanso Kabushiki Kaisha, Japan

Filed Sep. 12, 1983, Ser. No. 531,345

Claims priority, application Japan, Sep. 14, 1982, 57-160396

Int. Cl.³ B01J 20/04, 20/14, 20/10

U.S. Cl. 502—411 **11 Claims**

2. An absorbent for treating a gas containing at least one compound of volatile inorganic hydrides, volatile inorganic halogenides and organometallic compounds, comprising an aqueous solution of alkali and an oxidizing agent capable of oxidizing germane, the aqueous solution being impregnated into a porous solid carrier, the alkali being at least one selected from the group consisting of sodium hydroxide, potassium hydroxide and calcium hydroxide.

5. An absorbent as recited in claim 2, wherein the oxidizing agent is potassium permanganate, potassium bromate, hydrogen peroxide or sodium hypochlorite.

4,535,073

ANTIHYPERTENSIVE PHOSPHONO DERIVATIVES OF HANTZSCH DIHYDROPYRIDINES

Kiyoshi Kimura, Takatsuki; Iwao Morita, Tsuzuki, and Seiichiro Morimura, Moriyama, all of Japan, assignors to Nippon Shinyaku Co Limited, Japan

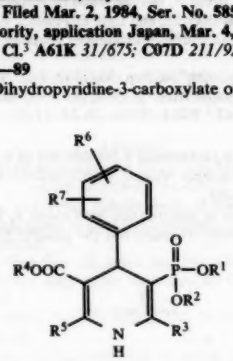
Filed Mar. 2, 1984, Ser. No. 585,574

Claims priority, application Japan, Mar. 4, 1983, 58-36211

Int. Cl.³ A61K 31/675; C07D 211/92, 401/12

U.S. Cl. 514—89 **33 Claims**

1. A 1,4-Dihydropyridine-3-carboxylate of the formula (I)



(I)

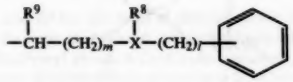
or a pharmaceutically acceptable salt thereof in which:

R^1 and R^2 are the same or different and are hydrogen; alkyl of 1 to 10 carbon atoms, alkenyl of 2 to 10 carbon atoms, alkynyl of 2 to 10 carbon atoms, cycloalkyl of 3 to 7 carbon atoms,

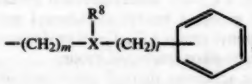
aryl of 6 to 10 carbon atoms, arylalkyl of 7 to 9 carbon atoms, or cycloalkyl-lower alkyl of 3 to 7 carbon atoms in the cycloalkyl moiety, unsubstituted or substituted by halogen or alkoxy of 1 to 4 carbon atoms; or tetrahydrofurfuryl unsubstituted or substituted by alkyl of 1 to 3 carbon atoms;

R^3 is lower alkyl,

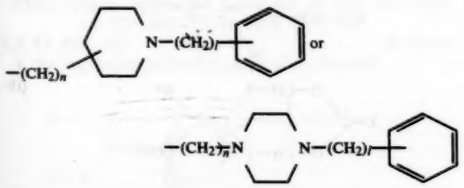
R^4 is hydrogen; alkyl of 1 to 10 carbon atoms, alkenyl of 2 to 10 carbon atoms, alkynyl of 2 to 10 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkenyl of 3 to 7 carbon atoms, aryl of 6 to 10 carbon atoms, or cycloalkyl-lower alkyl or cycloalkenyl-lower alkyl of 3 to 7 carbon atoms in the cyclic moiety, unsubstituted or substituted by alkoxy of 1 to 3 carbon atoms, aryloxy of 6 to 10 carbon atoms in the aryloxy moiety, aralkyloxy of 6 to 10 carbon atoms in the aralkyloxy moiety, amino, mono- or di-lower alkylamino, alkylthio of 1 to 3 carbon atoms, mono- or di-lower alkylamino-lower alkyl, alkylthioalkyl of 1 to 3 carbon atoms in both alkyl moieties, pyridyl or pyridyl-lower alkyl; tetrahydrofurfuryl unsubstituted or substituted by alkyl of 1 to 3 carbon atoms;



in which X is N or O, R^8 is lower alkyl or lower alkenyl when X is N and is not present when X is O, R^9 is hydrogen, alkyl of 1 to 3 carbon atoms, phenyl, or



in which R^8 and X are as above defined, l is an integer of 0 to 2, and m is an integer of 1 to 4; or

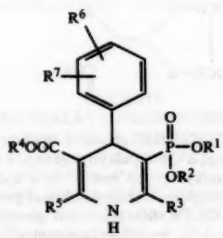


in which l is as defined above and n is an integer of 0 to 2;

R^5 is lower alkyl; and

R^6 and R^7 are the same or different and are nitro, cyano, trifluoromethyl, halogen, azide, alkoxycarbonyl of 1 to 3 carbon atoms in the alkoxy moiety, aminocarbonyl, sulfamyl, alkylsulfonyl of 1 to 3 carbon atoms in the alkyl moiety or difluoromethoxy or one of R^6 and R^7 is hydrogen and the other is as above defined.

10. A pharmaceutical composition useful for effecting vasodilation and hypotensive activity in humans and animals which comprises a therapeutically effective amount of a compound of the formula (I):



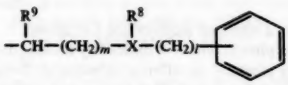
(I)

or a pharmaceutically acceptable salt thereof in which:

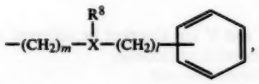
R^1 and R^2 are the same or different and are hydrogen; alkyl of 1 to 10 carbon atoms, alkenyl of 2 to 10 carbon atoms, alkynyl of 2 to 10 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, aryl of 6 to 10 carbon atoms, arylalkyl of 7 to 9 carbon atoms, or cycloalkyl-lower alkyl of 3 to 7 carbon atoms in the cycloalkyl moiety, unsubstituted or substituted by halogen or alkoxy of 1 to 4 carbon atoms; or tetrahydrofurfuryl unsubstituted or substituted by alkyl of 1 to 3 carbon atoms;

R^3 is lower alkyl,

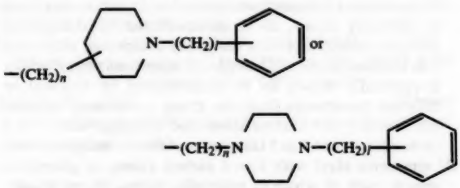
R^4 is hydrogen; alkyl of 1 to 10 carbon atoms, alkenyl of 2 to 10 carbon atoms, alkynyl of 2 to 10 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkenyl of 3 to 7 carbon atoms, aryl of 6 to 10 carbon atoms, or cycloalkyl-lower alkyl or cycloalkenyl-lower alkyl of 3 to 7 carbon atoms in the cyclic moiety, unsubstituted or substituted by alkoxy of 1 to 3 carbon atoms, aryloxy of 6 to 10 carbon atoms in the aralkyloxy moiety, aralkyloxy of 6 to 10 carbon atoms in the aralkyloxy moiety, amino, mono- or di-lower alkylamino, alkylthio of 1 to 3 carbon atoms, mono- or di-lower alkyl amino-lower alkyl, alkylthioalkyl of 1 to 3 carbon atoms in both alkyl moieties, pyridyl or pyridyl-lower alkyl; tetrahydrofurfuryl unsubstituted or substituted by alkyl of 1 to 3 carbon atoms;



in which X is N or O, R^8 is lower alkyl or lower alkenyl when X is N and is not present when X is O, R^9 is hydrogen, alkyl of 1 to 3 carbon atoms, phenyl, or



in which R^8 and X are as above defined, l is an integer of 0 to 2, and m is an integer of 1 to 4; or



in which l is as defined above and n is an integer of 0 to 2;

R^5 is lower alkyl; and

R^6 and R^7 are the same or different and are nitro, cyano, trifluoromethyl, halogen, azide, alkoxycarbonyl of 1 to 3 carbon atoms in the alkoxy moiety, aminocarbonyl, sulfamyl, alkylsulfonyl of 1 to 3 carbon atoms in the alkyl moiety or difluoromethyoxy or one of R^6 and R^7 is hydrogen and the other is as above defined, in combination with a pharmaceutically acceptable carrier.

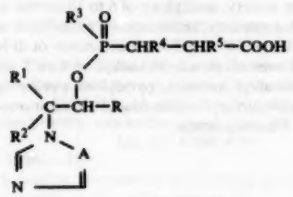
4,535,074

FUNGICIDAL PHOSPHORYLATED AZOLYL DERIVATIVES

Reinhard Preuss; Hermann Perrey, both of Krefeld; Helmut Ritter, Wuppertal; Paul Reinecke, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,323
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1983, 3313719
Int. Cl.³ A01N 57/24; C07F 9/65
U.S. Cl. 514—93 8 Claims

1. A phosphorylated azolyl derivative of the formula



in which

A represents a nitrogen atom or the CH group,

R represents phenyl which is optionally mono-, di- or tri-substituted by identical or different substituents from the group comprising halogen and alkyl with 1 to 4 carbon atoms, or represents the grouping

wherein X and Y are identical or different and represent hydrogen, fluorine or chlorine;

R^1 represents hydrogen and

R^2 represents hydrogen or phenoxy or benzyl, each of which is optionally mono-, di- or tri-substituted by identical or different substituents from the group comprising halogen, alkyl with 1 to 4 carbon atoms, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl part, nitro and optionally halogen-substituted phenyl, or

R^1 and R^2 together represent the grouping =CH—Z, wherein Z represents cycloalkyl which has 5 to 7 carbon atoms and is optionally mono-, di- or tri-substituted by identical or different substituents from the group comprising alkyl with 1 to 4 carbon atoms and halogen, or represents phenyl which is optionally mono-, di- or tri-substituted by identical or different substituents from the group comprising halogen, alkyl with 1 to 4 carbon atoms and haloalkyl with 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms,

R^3 represents alkyl with 1 to 4 carbon atoms, or phenyl or benzyl, each of which is optionally mono-, di- or tri-substituted by identical or different substituents, possible substituents being the substituents on phenyl which have already been mentioned under Z,

R^4 represents hydrogen or alkyl with 1 to 4 carbon atoms and

R^5 represents hydrogen or alkyl with 1 to 4 carbon atoms,

or a salt or addition product thereof with a metal salt.

7. A method of combatting fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of a compound, salt or addition product according to claim 1.

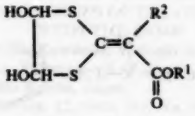
4,535,075

DITHIOLANE DERIVATIVE, PROCESS FOR PRODUCING THE SAME AND USE THEREOF

Hitoshi Kurono, Toyonaka; Kuniaki Taninaka, Neyagawa; Tatsuyoshi Sugimoto, Hashimoto, and Minoru Katoh, Fujiidera, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,830
Claims priority, application Japan, Jun. 28, 1982, 57-111182
Int. Cl.³ C07D 495/04, 339/09; A61K 31/38, 31/285
U.S. Cl. 514—96 40 Claims

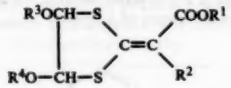
1. A dithiolane represented by the formula (I):



(I)

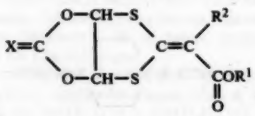
wherein R^1 is a C_1–C_8 alkyl group, a cyclohexyl group, a C_3–C_5 alkenyl group, a C_3–C_6 alkynyl group, a benzyl group or a C_2–C_8 alkoxyalkyl group and R^2 is a cyano group, a C_2–C_9 alkylcarbonyl group, a benzylcarbonyl group, a phenylcarbonyl group, a C_2–C_9 alkoxycarbonyl group, a cyclohexyloxycarbonyl group, a benzyloxycarbonyl group, a C_4–C_6 alkenyloxycarbonyl group, a C_4–C_7 alkynyloxycarbonyl group or a C_3–C_9 alkoxyalkoxycarbonyl group;

or an organic acid ester thereof which ester is:



(Ia)

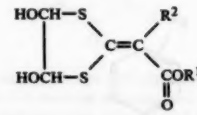
or



(Ib)

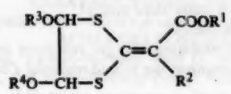
wherein R^1 and R^2 are the same as defined above; R^3 and R^4, which may be same or different, are individually hydrogen, a C_2–C_7 alkylcarbonyl group, a C_2–C_5 alkoxycarbonyl group, a C_2–C_9 mono or di-alkylcarbamoyl group, a C_3–C_6 carboxyalkylcarbonyl group, a C_4–C_7 carboxyalkenylcarbonyl group, or a salt thereof, provided that R^3 and R^4 are not both hydrogen; and X is oxygen or sulfur.

10. A pharmaceutical composition for controlling liver damage, comprising a pharmaceutically acceptable diluent and an effective amount of a dithiolane compound represented by the formula (I):



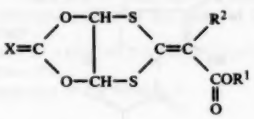
(I)

wherein R^1 is a C_1–C_8 alkyl group, a cyclohexyl group, a C_3–C_5 alkenyl group, a C_3–C_6 alkynyl group, a benzyl group or a C_2–C_8 alkoxyalkyl group and R^2 is a cyano group, a C_2–C_9 alkylcarbonyl group, a benzylcarbonyl group, a phenylcarbonyl group, a C_2–C_9 alkoxycarbonyl group, a cyclohexyloxycarbonyl group, a benzyloxycarbonyl group, a C_4–C_6 alkenyloxycarbonyl group, a C_4–C_7 alkynyloxycarbonyl group or a C_3–C_9 alkoxyalkoxycarbonyl group; or an organic acid ester thereof which ester is:



(I)a

or



(I)b

wherein R^1 and R^2 are the same as defined above; R^3 and R^4, which may be same or different, are individually hydrogen, a C_2–C_7 alkylcarbonyl group, a C_2–C_5 alkoxycarbonyl group, a C_2–C_9 mono or di-alkylcarbamoyl group, a C_3–C_6 carboxyalkylcarbonyl group, a C_4–C_7 carboxyalkenylcarbonyl group, or a salt thereof, provided that R^3 and R^4 are not both hydrogen; and X is oxygen or sulfur.

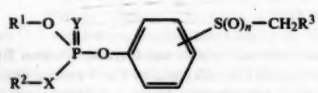
4,535,076

ORGANOPHOSPHATE PESTICIDES

Junichi Saito, Tokyo; Akio Kudamatsu, Kanagawa; Toyohiko Kume, and Shinichi Tsuboi, both of Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

Filed Jun. 10, 1983, Ser. No. 503,371
Claims priority, application Japan, Jun. 18, 1982, 57-103908
Int. Cl.³ A01N *57/14;* **C07F** *9/09, 9/24*
U.S. Cl. 514—128 **15 Claims**

1. An organophosphate derivative of the formula



in which
X is O, S or NH,
Y is O or S,
R^1 is a lower alkyl group,
R^2 is a lower alkyl group or a lower alkoxy-lower alkyl group,
R^3 is a fluoro-substituted lower alkyl group, and
n is 0 or 2.
the $S(O)_n$—CH_2R^3 substituent being attached to the 2- or 4-position of the phenyl ring.

2. A method of combating pests which comprises applying to the pests or a pest habitat a pesticidally effective amount of an organophosphate derivative according to claim 1.

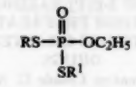
4,535,077

O-ETHYL S,S-DIALKYL PHOSPHORODITHIOATES FOR USE AS PESTICIDES

Mohamed A. H. Fahmy, Princeton, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 470,736, Feb. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 297,437, Aug. 28, 1981, abandoned. This application Dec. 8, 1983, Ser. No. 559,516
Int. Cl.³ A01N *57/12;* **C07F** *9/165*
U.S. Cl. 514—143 **5 Claims**

1. A compound of the formula



in which one R and R^1 is s-butyl and the other R and R^1 is s-butyl or t-butyl.

4. A method for controlling soil-borne insects and nematodes which comprises applying to the soil in which agricultural crops are planted or are to be planted a soil-borne insect and nematode controlling amount of the compound of claim 1, 2, or 3.

4,535,078

ANTIBACTERIAL COMPOSITION COMPRISING SILVER SULFADIAZINE AND SODIUM PIPERACILLIN

Charles L. Fox, Jr., Fort Lauderdale, Fla., and Shanta M. Modak, River Edge, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Apr. 6, 1984, Ser. No. 597,531
Int. Cl.³ A61K *31/429, 31/625*
U.S. Cl. 514—157 **7 Claims**

1. An antibacterial composition useful in burn therapy comprising silver sulfadiazine, sodium piperacillin and a physiologically acceptable carrier, said composition containing a total of from about 35 millimoles to about 60 millimoles of silver sulfadiazine and sodium piperacillin per kilogram of the composition in a millimole ratio of silver sulfadiazine to sodium piperacillin of from about 2:1 to about 1:2.

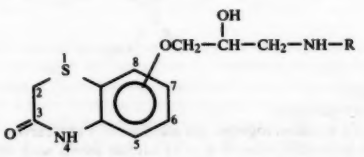
4,535,079

ALKANOLAMINOXY DERIVATIVES OF 3,4-DIHYDRO-2H-1,4-BENZOTHIAZIN-3-ONE, THEIR PRODUCTION PROCESS, AND THEIR PHARMACEUTICAL USE

Arnaldo Fravolini, S.Sisto, Italy, assignor to Mediolanum Farmaceutici S.R.L., Milan, Italy

Filed Oct. 18, 1983, Ser. No. 543,013
Claims priority, application Italy, Oct. 20, 1982, 49313 A/82
Int. Cl.³ A61K *31/38;* **C07D** *279/10*
U.S. Cl. 514—225 **6 Claims**

1. Alkanolaminoxy derivatives of 3,4-dihydro-2H-1,4-benzothiazin-3-one of formula



in which R is an isopropyl, secondary butyl, tertiary butyl or 2(3,4-dimethoxy-phenyl)-ethyl radical, or their salts.

4,535,080

DERIVATIVES OF 2-PIPERAZINO-PYRIMIDINE, METHODS FOR THEIR PREPARATION AND THEIR UTILIZATION AS DRUGS OR INTERMEDIATES FOR DRUGS

Francois Audiau, Charenton; Claude G. A. Gueremy, Houilles, and Gérard R. Le Fur, Plessis Robinson, all of France, assignors to Pharmuka Laboratoires, Gennevilliers, France

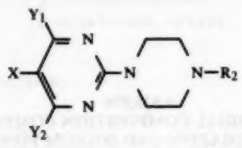
Continuation of Ser. No. 361,235, Mar. 24, 1982, abandoned. This application Aug. 24, 1983, Ser. No. 525,799

Claims priority, application France, Apr. 7, 1981, 81 06924

Int. Cl.³ A61K *31/505;* **C07D** *403/04*

U.S. Cl. 514—255 **8 Claims**

1. A drug, particularly useful as an antihypertension, hypoglycemic, antimigraine or antidepressant drug which contains a pharmaceutically acceptable carrier and, as the active principle, an effective amount of a compound of the formula:



(I)

in which X is hydrogen, chlorine, alkyl, alkoxy or alkylthio wherein the alkyl has from 1 to 3 carbon atoms, R_2 is hydrogen or alkyl having 1 to 3 carbon atoms, Y_2 is chlorine and Y_1 is

in which R_1 is hydrogen or straight or branched chain alkyl having 1 tc 7 carbon atoms, cycloalkyl having 3 to 7 carbon atoms or cycloalkylalkyl having 4 to 8 carbon atoms or a salt of said compound with a pharmaceutically acceptable acid.

4,535,081

ANTIALLERGIC AND ANTIULCER 1-OXO-1H-THIAZOLO[3,2-A]PYRIMIDINE-2-CARBOXAMIDES AND INTERMEDIATES THEREFOR

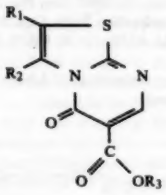
Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 312,372, Oct. 19, 1981, Pat. No. 4,423,048, which is a division of Ser. No. 96,631, Nov. 23, 1979, abandoned. This application Aug. 17, 1983, Ser. No. 523,932

Int. Cl.³ A61K *31/505;* **C07D** *513/04*

U.S. Cl. 514—258 **10 Claims**

1. A compound of the formula



wherein

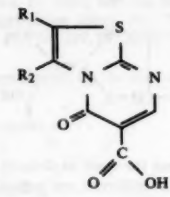
R_3 is hydrogen;

R_1 and R_2 taken together are alkylene of 3 to 9 carbon atoms or phenylalkylene of 9 to 11 carbon atoms with the proviso that the ring system so formed is 5- to 8-membered;

R_1 and R_2 taken separately are each hydrogen or lower alkyl of 1 to 5 carbon atoms, provided that when R_2 is hydrogen, R_1 is other than hydrogen or methyl and when R^1 is hydrogen, R^2 is other than methyl;

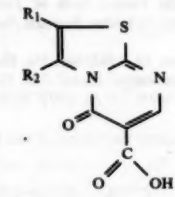
and cationic salts thereof.

4. A method of inhibiting allergic reactions in a mammal which comprises administering to said mammal a compound of the formula



or a pharmaceutically-acceptable salt thereof, wherein R_1 and R_2 when taken together are alkylene of 4 to 9 carbon atoms or phenylalkylene of 9 to 11 carbons, with the proviso that the ring system so formed is 5- to 8-membered, or, when taken separately, R_1 is alkyl or 2 to 5 carbon atoms, and R_2 is hydrogen or alkyl of 1 to 5 carbon atoms, in an amount sufficient to inhibit said allergenic reactions.

6. A method of inhibiting gastric ulcers in a mammal which comprises administering to said mammal a compound of the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 and R_2 when taken together are alkylene of 3 to 9 carbon atoms or phenylalkylene of 9 to 11 carbon atoms, with the proviso that the ring system so formed is 5- to 8-membered, and R_1 and R_2 when taken separately are each hydrogen or alkyl of 1 to 5 carbon atoms, with the proviso that when R_2 is hydrogen, R_1 is other than hydrogen or methyl, in an amount sufficient to inhibit said gastric ulcers.

4,535,082

COMBINING AN ANIONIC BLOCKING AGENT WITH DYPHYLLINE

Erwin N. Terry, Montreal, Canada, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Fed. Rep. of Germany

Filed Dec. 9, 1980, Ser. No. 214,681

Int. Cl.³ A61K *31/465*

U.S. Cl. 514—264 **18 Claims**

1. A process for increasing the half-life of dyphylline administered to a human which comprises prior or concurrent administration of an effective amount of probenecid.

4,535,083
CLEAVAGE PRODUCTS OF 4',6'-DIDESOXY-4'-THIO-,6'-AMINO-HEPTURONIC ACID NUCLEOSIDES

Günter Benz, Velbert-Neviges; Karl G. Metzger, Wuppertal-Elberfeld, and Hans-Joachim Zeiler, Velbert-Neviges, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

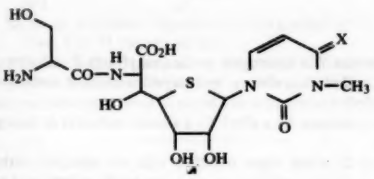
Filed Sep. 9, 1983, Ser. No. 530,835

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1982, 3236389

Int. Cl.³ A61K *31/505;* C07D *239/47, 239/54*

U.S. Cl. 514—274 13 Claims

1. A compound of the formula I



(I)

in which X is N—CO—NH_2 or 0.

7. A medicament in dosage unit form comprising an antimycrobially effective amount of a compound according to claim 1 and an inert pharmaceutical carrier.

9. A method of combating bacterial infection in warm-blooded animals which comprises administering to said animals an antibacterially effective amount of an active compound according to claim 1 either alone or in admixture with an inert pharmaceutical carrier or in the form of a medicament.

4,535,084
CERTAIN 4-(2-HYDROXYETHYLTHIOMETHYL)PYRIDINES AND DERIVATIVES THEREOF HAVING IMMUNOREGULATORY ACTIVITY

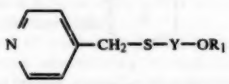
Joseph G. Lombardino, Niantic, and Charles A. Harbert, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 265,856, May 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 168,127, Jul. 14, 1980, abandoned, which is a division of Ser. No. 85,011, Oct. 15, 1979, Pat. No. 4,246,263. This application Mar. 18, 1983, Ser. No. 474,571

Int. Cl.³ C07D *213/32;* A61K *31/44*

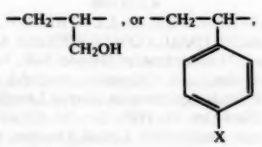
U.S. Cl. 514—277 25 Claims

1. A compound of the formula



and pharmaceutically acceptable salts thereof, wherein

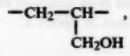
Y is propylene, ethylene (unsubstituted or substituted with up to 2 methyl groups and up to 1 phenyl group),



wherein X is nitro or methoxy;

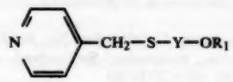
R_1 is hydrogen, (C_2–C_5)alkanoyl or benzoyl;

with the proviso that when Y is



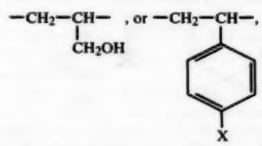
R_1 is hydrogen.

14. A method for regulating the immune response in a mammal which comprises administering to said mammal an immune response regulating amount of a compound of the formula



or a pharmaceutically acceptable salt thereof, wherein

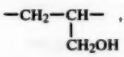
Y is propylene, ethylene (unsubstituted or substituted with up to 2 methyl groups and up to 1 phenyl group),



wherein X is nitro or methoxy;

R_1 is hydrogen, (C_2–C_5) alkanoyl or benzoyl;

with the proviso that when Y is



R_1 is hydrogen; together with a pharmaceutically acceptable carrier.

4,535,085
PERFLUOROTRICYCLIC AMINES AS OXYGEN CARRIERS

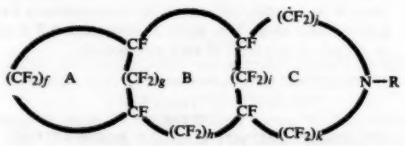
Kazumasa Yokoyama, Toyonaka; Chikara Fukaya, Osaka; Yoshio Tsuda, Takarazuka; Taizo Ono, Osaka; Yoshio Arakawa; Yoshihisa Inoue, both of Suita; Youichiro Naito, Hirakata, and Tadakazu Suyama, Kyoto, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Mar. 29, 1983, Ser. No. 480,131

Int. Cl.³ A61K *31/445, 31/40;* C07D *221/16, 221/22*

U.S. Cl. 514—290 4 Claims

1. A perfluorotricyclic amine compound represented by the formula



wherein R denotes a perfluoroalkyl group having 1 to 4 carbon atoms; the ring A denotes a five- or six-membered ring, the ring B denotes a five-, six- or seven-membered ring, the ring C denotes a five- or six-membered ring any one of the rings A, B and C optionally being substituted by one or more lower perfluoroalkyl groups in addition to the above-mentioned substituent R: and further f, g, h, i, j and k denote integers appropriately selected to construct the above-mentioned size of rings A, B and C.

2. A composition for use as a blood substitute or an infusion fluid which composition is an aqueous emulsion of a perfluorotricyclic amine as defined in claim 1.

4,535,086

4,5,6,7-TETRAHYDRO-4,4,7,7-TETRAMETHYLBENZO-[b]-THIEN-2-YL OR FURAN-2-YL DERIVATIVES

Michael Klaus, Weil am Rhein, Fed. Rep. of Germany; Peter Loeliger, Muttenz, and Harald Weiser, Hochwald, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

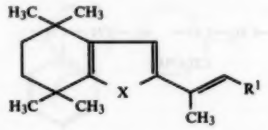
Filed Jun. 27, 1983, Ser. No. 507,857

Claims priority, application Switzerland, Jul. 6, 1982, 4117/82; May 19, 1983, 2728/83

Int. Cl.³ A61K *31/44*; C07D *405/06*

U.S. Cl. 514—337 **7 Claims**

1. A compound of the formula



I

wherein X is —O— or —S—; R^1 is a group Ar—R^2; Ar is pyridyl; R^2 is a group —CO_2R^3, —C(O)R^4, —CH_2OR^3, lower-alkylsulphonyl or formyl; R^3 is hydrogen or lower-alkyl, and R^4 is hydrogen, hydroxy, amino, lower-alkylamino, di(lower-alkyl)amino or lower-alkyl; and salts thereof.

4,535,087

N-SUBSTITUTED PHENOXYACETAMIDE FUNGICIDES

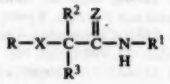
David M. Spatz, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 19, 1982, Ser. No. 443,010

Int. Cl.³ A61K *31/44*

U.S. Cl. 514—352 **6 Claims**

1. A method for controlling fungi which comprises contacting said fungi or their growth environment with a fungicidally effective amount of a compound of the formula:



wherein R is phenyl, or phenyl substituted with 1 to 4 of the same or different substituents independently selected from fluoro, chloro, bromo, iodo, lower alkyl, trihalomethyl, or nitro; R^1 is 3-pyridyl; R^2 and R^3 are independently hydrogen or lower alkyl; X is sulfur or oxygen; and Z is sulfur or oxygen or mixtures of such compounds.

4,535,088

PROPYNYLAMINOTHIAZOLE DERIVATIVES

Yasuo Makisumi, Hyogo; Akira Murabayashi; Katsuya Tawara, both of Osaka; Yoshihachi Watanabe, Shiga, and Toshio Takahashi, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

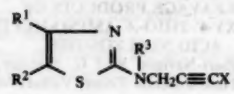
Filed Dec. 2, 1983, Ser. No. 557,365

Claims priority, application Japan, Dec. 21, 1982, 57-225271

Int. Cl.³ C07D *277/42*; A01N *43/78*

U.S. Cl. 514—370 **24 Claims**

1. A compound selected from the group consisting of a compound of the formula I:



I

wherein

R^1 is hydrogen, C_{1-4} alkyl, carboxy, formyl, hydroxy-C_{1-4} alkyl, mono- or di-C_{1-4} alkyl-aminomethyl, C_{1-4} alkoxy-carbonyl, hydroxyiminomethyl, phenyl or

wherein Y is hydrogen or C_{1-4} alkyl and Z is hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, hydroxy-C_{1-4} alkyl or carboxy-C_{1-4} alkyl;

R^2 is hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy-carbonyl or halogen; or

R^1 and R^2 when taken together with the attached carbons are a condensed benzene ring optionally substituted by 1 or 2 groups selected from the group consisting of C_{1-4} alkyl and C_{1-4} alkoxy;

R^3 is hydrogen or C_{1-4} alkyl; and

X is hydrogen or iodine, and

a salt of said compound.

4,535,089

ALKYLOXAZOLYLACETIC ACID DERIVATIVE FOR THE TREATMENT OF HYPERLIPIDEMIA

Kazuo Matsumoto, Ibaraki; Seiichi Takabe, Amagasaki, and Kohki Takashima, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

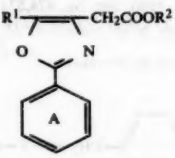
Filed May 12, 1983, Ser. No. 494,023

Claims priority, application Japan, May 19, 1982, 57-85282

Int. Cl.³ A61K *31/42*

U.S. Cl. 514—374 **3 Claims**

1. A method for the treatment or prophylaxis of hyperlipidemia which comprises administering to a host a compound of the formula:



wherein Ring A is monohalogenophenyl, R^1 is an alkyl of one to 5 carbon atoms and R^2 is hydrogen or an alkyl of one to 2 carbon atoms.

4,535,090

3,5-DIPHENYL-1H-1,2,4-TRIAZOLES PHARMACEUTICAL COMPOSITIONS AND USES

Giulio Galliani, Monza; Amedeo Omodei-Salé, Voghera; Pietro Consonni, Milan, and Alessandro Assandri, Mariano Comense, all of Italy, assignors to Gruppo Lepetit S.p.A., Italy

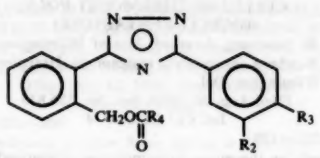
Filed Oct. 15, 1982, Ser. No. 434,451

Claims priority, application United Kingdom, Oct. 20, 1981, 8131657

Int. Cl.³ A61K *31/41*; C07D *249/10, 405/10*

U.S. Cl. 514—383 **4 Claims**

1. A 3,5-diphenyl-1H-1,2,4-triazole having the formula



wherein

R_2 is methoxy or ethoxy;

R_3 is hydrogen, methyl, methoxy, ethoxy or when R_2 and R_3 are taken together represent a methylenedioxy group; and

R_4 is an aliphatic saturated hydroxycarbyl group having from 5 to 14 carbon atoms.

4. A method of terminating pregnancy in mammal which comprises the administration of a contragestational effective amount of a compound of claim 1 to a mammal in need thereof.

4,535,091

O-PYRAZOLYL-N-CYANOALKYLSULPHENYL-CARBAMATE PESTICIDES

Fritz Maurer, Wuppertal; Bernhard Homeyer, Leverkusen, and Benedikt Becker, Mettmann, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

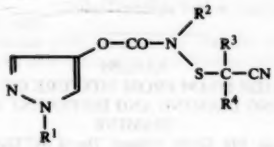
Filed Mar. 14, 1984, Ser. No. 589,290

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310831

Int. Cl.³ A01N *43/56;* **C07D** *231/18*

U.S. Cl. 514—407 **6 Claims**

1. An O-(pyrazol-4-yl) N-(α-cyanoalkylsulphenyl)carbamate of the formula



in which

R^1 is C_1–C_8-alkyl or C_3–C_8-cycloalkyl,

R^2 is C_1–C_6-alkyl and

R^3 and R^4 each independently is C_1–C_6-alkyl or together are a C_4–C_7-alkylene radical.

5. A method of combating insects, acarids or nematodes which comprises administering to such insects, acarids or nematodes or a habitat thereof an insecticidally, acaricidally or nematicidally effective amount of a compound according to claim 1.

4,535,092

ACYLANILIDES HAVING ANTIANDROGENIC ACTIVITY

Leslie R. Hughes, Macclesfield, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

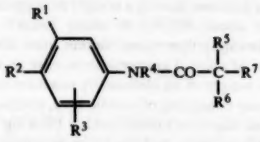
Filed Nov. 1, 1982, Ser. No. 438,351

Claims priority, application United Kingdom, Nov. 6, 1981, 8133613

Int. Cl.³ A61K *31/38;* **C07D** *333/32*

U.S. Cl. 514—438 **9 Claims**

1. An acylanilide of the formula:



wherein R^1 is cyano, carbamoyl, nitro, fluoro, chloro, bromo, iodo or hydrogen, or alkyl, alkoxy, alkanoyl, alkylthio, alkylsulphinyl, alkylsulphonyl, perfluoroalkyl, perfluoroalkylthio, perfluoroalkylsulphinyl or perfluoroalkylsulphonyl each of up to 4 carbon atoms, or phenylthio, phenylsulphinyl or phenylsulphonyl;

wherein R^2 is cyano, carbamoyl, nitro, fluoro, chloro, bromo or iodo, or alkanoyl, alkylthio, alkylsulphinyl, alkylsulphonyl, perfluoroalkyl, perfluoroalkylthio, perfluoroalkylsulphinyl or perfluoroalkylsulphonyl each of up to 4 carbon atoms, or phenylthio, phenylsulphinyl or phenylsulphonyl;

wherein R^3 is hydrogen or halogen;

wherein R^4 is hydrogen or alkyl of up to 4 carbon atoms;

wherein R^5 is hydrogen, hydroxy, or alkoxy or acyloxy each of up to 15 carbon atoms;

wherein R^6 is alkyl or halogenalkyl of up to 4 carbon atoms;

and wherein R^7 is thienyl which is unsubstituted or bears one or two substituents selected from the group consisting of halogen, cyano, alkoxy, alkylthio, alkylsulphonyl each of up to 4 carbon atoms or trifluoromethyl.

9. A method for producing an antiandrogenic effect in a warm-blooded animal in need of such treatment which comprises administering to said animal an effective amount of acylanilide claimed in claim 1.

4,535,093

PHARMACEUTICAL AND DIETARY COMPOSITION

David F. Horrobin, Montreal, Canada, assignor to Efamol Limited, London, England

Division of Ser. No. 150,402, May 15, 1980, Pat. No. 4,388,324. This application Mar. 18, 1983, Ser. No. 476,708

Claims priority, application United Kingdom, May 18, 1979, 7917456

Int. Cl.³ A01N *37/02, 37/00*

U.S. Cl. 514—560 **8 Claims**

1. A pharmaceutical composition for treating alcoholism or moderating the effects of taking alcohol, comprising γ-linolenic acid and/or dihomo-γ-linolenic acid, as such or as a physiologically functional ester or other derivative thereof, in combination with ethyl alcohol, said composition being presented for administration in doses comprising 50 mg to 10 g of said γ-linolenic acid or dihomo-γ-linolenic acid or derivative (calculated as γ-linolenic acid) together with 5 to 500 ml of ethyl alcohol or one-half, one-third or one-quarter of said amounts.

4,535,094

ALKENYL AROMATIC MONOMER OLEFINICALLY UNSATURATED ACID FOAMS AND METHOD FOR THE PREPARATION THEREOF

Chung P. Park, Pickerington, and Kyung W. Suh, Granville, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 490,107, Apr. 29, 1983, abandoned, which is a continuation of Ser. No. 376,458, May 10, 1982, abandoned, which is a continuation of Ser. No. 224,427, Jan. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 141,541, Apr. 18, 1980, abandoned. This application Mar. 12, 1984, Ser. No. 588,469

Int. Cl.³ C08J *9/08*

U.S. Cl. 521—79 **3 Claims**

1. A method for the preparation of an improved, alkenyl

aromatic polymer foam, the method consisting essentially of intimately admixing a polymer having a weight average molecular weight of from about 100,000 to about 350,000 gram moles, the polymer having polymerized therein from about 99 to 70 parts by weight of alkenyl aromatic monomer and from about 1 to 30 parts by weight of an olefinically unsaturated acid selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid and mixtures thereof with a blowing agent which is a carbonate, carbonate hydrate or bicarbonate of an ion selected from the group consisting of sodium, magnesium, zinc, ammonium and mixtures thereof, the carbonate, carbonate hydrate or bicarbonate being present in the proportion of from about 0.5 to 20 parts by weight per hundred parts by weight of polymer, heat plastifying the polymer under a pressure sufficient to prevent foaming and a temperature sufficiently high to decompose the carbonate, carbonate hydrate or bicarbonate under a pressure sufficient to prevent foaming, subsequently passing the heat plastified polymer to a zone of lower pressure to thereby obtain a polymeric foam having a density of from about 0.5 to 8 pounds per cubic foot having a cell size of from about 0.1 to 5 millimeters.

4,535,095

POLYPHOSPHAZENE COMPOUNDING PROCESS

Warren B. Mueller, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 10, 1984, Ser. No. 680,183
Int. Cl.[3] C08J *9/00*
U.S. Cl. 521—89 **12 Claims**

1. A process for making a foamable polyphosphazene composition suitable for consistent conversion to a foamed polyphosphazene article having a density below about 5 pounds per cubic foot, said process comprising

(a) intensively mixing a masterbatch composition comprising
  (i) a curable high molecular weight substantially linear polyphosphazene gum;
  (ii) an inorganic filler;
  (iii) a chemical blowing agent; and
  (iv) processing aid(s) and optionally other conventional masterbatch components but excluding curing agents.
(b) mixing a concentrate comprising
  (i) a curable high molecular weight substantially linear polyphosphazene gum and
  (ii) 1 or more curing agents to form a concentrate, the amount of said curing agent(s) in said concentrate being at least 10 times the amount required to cure the polyphosphazene gum in said concentrate and
(c) blending said masterbatch composition and said concentrate in a weight ratio of at least 10:1 and such that the resultant blend contains an effective amount of curing agent sufficient to cure all of the gum in said blend.

4,535,096

POLYESTER POLYURETHANE FOAM BASED MEDICAL SUPPORT PAD

Barry A. Jacobs, Bethel, Conn., and Gerald Fesman, Teaneck, N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 27, 1984, Ser. No. 584,042
Int. Cl.[3] C08G *18/14*
U.S. Cl. 521—107 **28 Claims**

1. A polyurethane foam adapted to be used as a medical support pad material for bedridden patients which is formed by the reaction of a polyester polyol, isocyanate, and blowing agent combination of water and halogenated hydrocarbon auxiliary blowing agent and which contains an effective flame retardant amount of halogenated flame retardant and a char forming and dripping ember retardant additive.

4,535,097

CELLULAR THERMOSET POLY (DICYCLOPENTADIENE)

Norman R. Newburg, deceased, late of Wilmington, Del. (by Betty Newburg, executrix), assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 26, 1983, Ser. No. 526,835
Int. Cl.[3] C08J *9/14*
U.S. Cl. 521—139 **4 Claims**

1. A cellular thermoset homopolymer comprised of polymerized units of dicyclopentadiene monomer and having a density of from about 0.2 to about 0.85 g/ml.

4,535,098

MATERIAL FOR ABSORBING AQUEOUS FLUIDS

Syamalarao Evani, Midland; James H. Oswald, Auburn; Thomas L. Staples, and Brent T. Polak, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 12, 1984, Ser. No. 588,483
Int. Cl.[3] C08L *31/02*
U.S. Cl. 521—149 **27 Claims**

1. A composition capable of absorbing an aqueous liquid which composition comprises a functionally effective amount of a swellable addition polymer comprising, in polymerized form, (a) a major portion of at least one water-soluble monomer, (b) a minor portion of at least one water-insoluble monomer having a pendant hydrophobic moiety, and optionally, (c) a minor portion of a crosslinking moiety in an amount sufficient to provide gel strength to the polymer; which polymer is polymerized in the presence of at least a micelle forming amount of a surfactant composition containing at least one ionic surfactant; and which polymer is capable of undergoing hydrophobic association through hydrophobic groups of said polymer such that said polymer is swellable but not readily soluble in the presence of an aqueous liquid when said polymer is in intimate contact with an amount of surfactant, if any, which is less than that amount of surfactant which will solubilize said polymer in said aqueous liquid.

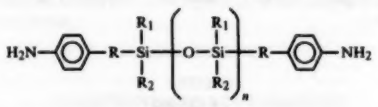
4,535,099

POLYIMIDE FOAM FROM MIXTURE OF SILICON CONTAINING DIAMINE AND DIFFERENT AROMATIC DIAMINE

Raymond Lee, Elk Grove Village; David W. Okey, Downers Grove, and Gregory A. Ferro, Mt. Prospect, all of Ill., assignors to IMI-Tech Corporation, Elk Grove Village, Ill.

Filed Apr. 3, 1984, Ser. No. 596,304
Int. Cl.[3] C08J *9/02*
U.S. Cl. 521—154 **8 Claims**

1. A polyimide foam prepared by reaction of an organic tetracarboxylic acid ester with (a) 0.1 to 15 mole % of a diamine having the formula:



wherein R is a C_2 to C_6 alkylene group, R_1 and R_2 are each independently lower alkyl containing 1 to 3 carbon atoms and n is an integer from 1 to 4 and (b) at least one amine having the formula:

$$H_2N—R_3—NH_2$$

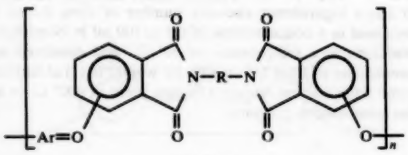
wherein R_3 is an aromatic group containing 5 to 16 carbon atoms.

4,535,100
POLYMER FOAM, THERMOFORMED SHAPES THEREOF AND METHODS OF FORMING SAME

Charles M. Krutchen, Pittsford, and Wen-Pao Wu, Victor, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,641
Int. Cl.³ C08J 9/14
U.S. Cl. 521—180 **4 Claims**

1. A polymer in foam form having a density of less than about 20 lbs/ft³, wherein said polymer is a solvent imbibable polyetherimide, wherein said solvent is a member selected from the group consisting of methylene chloride, chloroform, 1,1,2-trichloroethane and mixtures thereof wherein said polyetherimide is a polymer of the following structure:



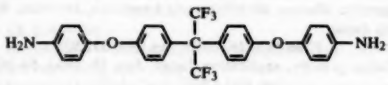
wherein n is a positive integer, Ar is a divalent radical containing from 6-20 carbon atoms, R is a bivalent radical selected from the group consisting of aliphthatic, cycloaliphatic aromatic and araliphatic groups.

4,535,101
POLYIMIDE OF 2,2-BIS(4-(4-AMINOPHENOXY)PHENYL)-HEXAFLUOROPROPANE AND PROCESS FOR THE PREPARATION OF SAME

Raymond Lee, Elk Grove Village; Usman A. K. Sorathia, Schaumburg, and Gregory A. Ferro, Mt. Prospect, all of Ill., assignors to Imi-Tech Corporation, Elk Grove Village, Ill.

Filed Apr. 3, 1984, Ser. No. 596,299
Int. Cl.³ C08J 9/02
U.S. Cl. 521—189 **8 Claims**

1. A polyimide foam prepared by reaction of an organic tetracarboxylic acid ester with (a) a diamine having the formula:



(b) at least one amine having the formula:

$H_2N—R—NH_2$

wherein R is an aromatic group containing 5 to 16 carbon atoms.

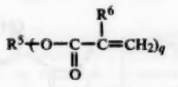
4,535,102
ADHESIVE COATING MATERIAL

Koshi Kusumpto, Kamakura; Toshio Kawaguchi, Fujisawa; Takeshi Nakahara, Fujisawa, and Shinichiro Kunimoto, Fujisawa, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Oct. 6, 1983, Ser. No. 539,417
Claims priority, application Japan, Nov. 24, 1982, 57-204683
Int. Cl.³ C08F 267/02, 265/02; C08K 5/05; A61K 6/08
U.S. Cl. 523—116 **24 Claims**

1. An adhesive coating material for a hard tissue, which comprises (1) a polymer having an acid value of 30 to 700 and comprising repeating units including a hydrophobic group and repeating units including two carboxyl (—COOH) groups or one carboxylic anhydride

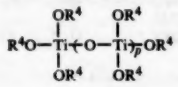
group bonded to the polymer, said carboxyl groups or carboxylic anhydride group being bonded to adjacent carbon atoms, (2) a polymerizable vinyl compound represented by the following formula



wherein R^5 stands for an organic group free of an ethylenic unsaturation, R^6 stands for a hydrogen atom or an alkyl group, and q is an integer of from 1 to 4,

or a mixture of said polymerizable vinyl compound and an organic titanate compound, a radical initiator comprising (3) and (4): (3) an organic peroxide, (4) an amine compound and (5) as a promoter, a sulfinic acid salt and/or a carboxylic acid salt.

9. An adhesive coating material as set forth in claim 1, which comprises as component (2) the mixture of the polymerizable vinyl compound and the organic titanate compound and wherein the organic titanate compound is a titanate represented by the following formula:



wherein R^4 stands for an alkyl group and p is a number of from 0 to 20.

4,535,103
COATING COMPOSITION

Hidehiko Kojo, Koshigaya, and Koji Akimoto, Tokyo, both of Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

Filed Apr. 24, 1984, Ser. No. 603,395
Int. Cl.³ C08L 63/00, 95/00
U.S. Cl. 523—450 **9 Claims**

1. A coating composition which comprises

(A) a polyol resin obtained by the reaction of an amino compound having at least one primary or secondary amino group with a prepolymer which prepolymer has been prepared by reacting an epoxy resin, with a phosphorus compound having at least P-OH group;

(B) a compound having more than one isocyanate group or groups which change to isocyanate groups under conditions effective for hardening the coating composition; and

(C) a material selected from the group consisting of coal tar, coal tar pitch, cut-back tar, bojuntan and asphalt

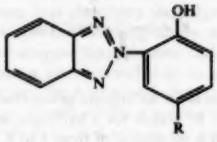
wherein the reaction ratio of said phosphorus compound to said epoxy resin, by equivalents of the hydroxy groups of said phosphorus compound to the epoxy groups of said epoxy resin, is from 0.05 to 0.9; the reaction ratio of said amino compound to said prepolymer, by equivalents of groups of said amino compound that are reactive with the epoxy groups of said prepolymer, is from 1.1 to 0.7; the ratio of (A) to (B), by equivalents of the hydroxy groups of (A) to the isocyanate groups of (B), is from 0.4 to 1.2; and the weight ratio of (C) to (A) is from 0.5 to 2.

4,535,104
ULTRAVIOLET LIGHT STABILIZED COPOLYESTERCARBONATE

Robert A. Pyles, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jul. 20, 1984, Ser. No. 633,116
Int. Cl.[3] C08K 5/27
U.S. Cl. 524—91 12 Claims

1. A composition comprising an aromatic copolyestercarbonate article surface impregnated with an ultraviolet light degradation inhibiting effective amount of a compound of the formula



wherein R is hydrogen or alkyl of one to twelve carbon atoms, inclusive.

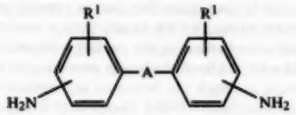
4,535,105
WHOLLY AROMATIC POLYAMIC ACID SOLUTION COMPOSITION

Toshihiro Inaike; Shuji Yamamoto; Shunji Ohe, and Kazunori Otsuka, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

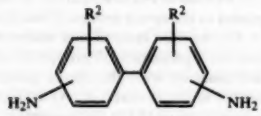
Filed Mar. 7, 1984, Ser. No. 587,177
Claims priority, application Japan, Mar. 8, 1983, 58-36682; May 9, 1983, 58-79355
Int. Cl.[3] C08K 5/34, 5/41, 5/20; C08L 79/08
U.S. Cl. 524—104 10 Claims

1. An aromatic polyamic acid solution composition comprising:

(I) an aromatic polyamic acid which is a polymerization product of (A) a tetracarboxylic acid component containing at least 80 molar % of the sum of (a) a first acid ingredient consisting of at least one member selected from the group consisting of 3,3',4,4'-biphenyl tetracarboxylic dianhydride and its functional derivatives and (b) a second acid ingredient consisting of at least one member selected from the group consisting of pyromellitic dianhydride, its functional derivatives, 3,3',4,4'-benzophenone tetracarboxylic dianhydride and it functional derivatives, the molar ratio of the first acid ingredient to the second acid ingredient being in the range of from 30:70 to 75:25, with (B) an amine component consisting of at least one aromatic diamine in a molar ratio of said tetracarboxylic acid component to said amine component of from 97:100 to 103:100, said amine component being selected from the group consisting of those of the formulae (I), (II) and (III).



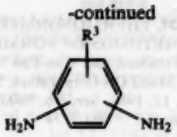
(I)



(II)

and

-continued



(III)

wherein R^1, R^2 and R^3 respectively represent, independent from each other, a member selected from the group consisting of a hydrogen atom, alkyl radicals having 1 to 5 carbon atoms, carboxyl radical, and alkoxyl radicals having 1 to 5 carbon atoms, and A represents a divalent radical selected from the group consisting of those of the formulae: —O—, —S—, —CO—, —SO_2—, —SO—, and —CH_2— and which polyamic acid has a logarithmic viscosity number of from 0.1 to 1.5 determined in a concentration of 0.5 g/100 ml in N-methyl-2-pyrrolidone at a temperature of 30° C., and dissolved in a concentration of from 5% to 40% by weight in (2) at least one organic polar solvent having a boiling point of 300° C. or less under atmospheric pressure.

4,535,106
THERMOPLASTIC COMPOSITIONS OF POLYPHENYLENE ETHER RESIN AND PRE-COMPOUNDED BLEND OF ORGANOPOLYSILOXANE AND POLY(ARYLOLEFIN-OLEFIN)

Visvaldis Abolins, Delmar, and Fred F. Holub, Schenectady, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 5, 1984, Ser. No. 658,282
Int. Cl.[3] C08K 5/51
U.S. Cl. 524—151 27 Claims

1. A thermoplastic composition comprising an admixture of:

(a) a polyphenylene ether resin; and

(b) a precompounded thermoplastic composition of a poly(arylolefin-olefin), an organopolysiloxane and an effective amount of a linking agent.

4,535,107
METHOD OF TREATING POLYESTER MATERIAL FOR RUBBER REINFORCEMENT

Shigemitsu Murase, 68-189 Terada Amatsuka, Joyo-Shi, Kyoto-Fu, Japan

Filed Sep. 16, 1983, Ser. No. 532,931
Claims priority, application Japan, Jan. 10, 1983, 58-2482
Int. Cl.[3] C08K 5/42, 5/15
U.S. Cl. 524—157 7 Claims

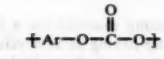
1. An aqueous composition for application to polyester cord comprising a salt of dioctylsulfosuccinate, an epoxy compound and a melamine compound.

4,535,108
FLAME RETARDANT POLYCARBONATE

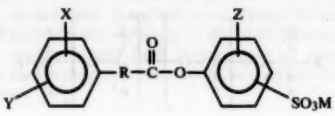
Niles R. Rosenquist, Evansville, and John A. Tyrell, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Feb. 25, 1981, Ser. No. 237,888
Int. Cl.[3] C07C 161/00; C08K 5/42
U.S. Cl. 524—162 20 Claims

1. A composition which comprises a polymer having a repeating unit

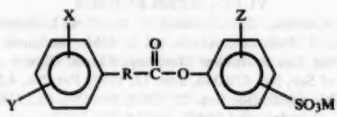


wherein Ar is an aromatic group in admixture with a flame retardant effective amount of a compound of the formula



wherein
R is a valence bond or an oxa group;
M is an alkali or alkaline earth metal;
X, Y and Z are the same or different and are hydrogen, alkyl, alkenyl, cycloalkyl, aryl, alkaryl, aralkyl, and alkoxy with the proviso that at least one of X, Y and Z is other than hydrogen.

10. A compound of the formula



wherein
R is a valence bond or an oxa group;
M is an alkali or alkaline earth metal;
X, Y and Z are the same or different and are hydrogen, alkyl of one to about twelve carbon atoms, inclusive; alkenyl of two to about twelve carbon atoms, inclusive; cycloalkyl of about five to eight carbon atoms, inclusive; phenyl; phenyl substituted alkyl of one to six carbon atoms, inclusive; alkyl substituted phenyl wherein alkyl is one to six carbon atoms, inclusive; and alkoxy of one to twelve carbon atoms, inclusive, with the proviso that at least one of X, Y and Z is other than hydrogen.

4,535,109
METHOD FOR PRODUCING SILICONE AQUEOUS EMULSION COMPOSITIONS

Hidetoshi Kondo, Ichihara, and Taro Koshii, Chiba, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Sep. 24, 1984, Ser. No. 653,174
Claims priority, application Japan, Oct. 31, 1983, 58-204482
Int. Cl.³ C08K *3/36*
U.S. Cl. 524—188 **6 Claims**

1. A method for producing silicone aqueous emulsion composition consisting essentially of
(1) adjusting a base emulsion composition which consists essentially of
(A) 100 parts by weight of a polydiorganosiloxane which contains at least 2 silicon-bonded hydroxyl groups per molecule, the organic groups being monovalent halogenated hydrocarbon radicals or monovalent hydrocarbon radicals,
(B) from 1 to 150 parts by weight colloidal silica or from 0.3 to 30 parts by weight alkali metal silicate,
(C) from 0.01 to 10 parts by weight of a curing catalyst, said catalyst being a metal salt of an organic acid,
(D) from 2 to 30 parts by weight emulsifier, and
(E) water to a pH of from 9 to 12,
(2) ripening at a temperature of from 10° to 95° C. for a sufficient period of time that an elastomeric material will be formed when water is removed at room temperature, and
(3) adding
(F) from 0.5 to 30 parts by weight of an amino-functional silane of the formula

$$(XR)_nSi(OR')_{4-n}$$

where X is an amino-functional radical, R is a divalent hydrocarbon radical containing no more than 8 carbon atoms, R' is a monovalent hydrocarbon radical containing less than 7 carbon atoms or is selected from the group consisting of $-CH_2OC_2H_5$ or $-CH_2CH_2OCH_3$, and n is 1, 2, or 3 or its partial hydrolysis condensate.

4,535,110
DUAL FUNCTIONAL ADDITIVE

Kenneth A. Iseler, Richmond; Probir K. Guha, Mt. Clemens, and Robert C. Yen, Troy, all of Mich., assignors to The Budd Company, Troy, Mich.

Filed Jun. 25, 1984, Ser. No. 624,458
Int. Cl.³ C08K *3/22*
U.S. Cl. 524—196 **6 Claims**

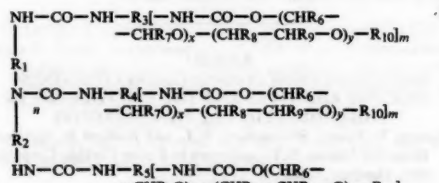
1. In a maturated moldable sheet molding compound suitable for molding under pressure, said molding compound having fillers and reinforcing materials dispersed in a thermosetting resin composition said resin being comprised primarily of an unsaturated polyester resin said resin including an aliphatically unsaturated monomer, a free radical polymerization catalyst and an internal mold release agent, said resin composition further containing a dual thickening system for modifying the viscosity of the resin composition, said dual thickening system comprising an oxide or hydroxide of magnesium or calcium and a polyisocyanate; the improvement comprising: using as the polyisocyanate an isocyanate terminated prepolymer having an NCO to OH ratio of from about 1.2/1 to 5/1 said isocyanate terminated prepolymer being the reaction product of one equivalent of a polyol having an average molecular weight of about 600 to 4000 and an average functionality between 2 and 6 with from 1.1 to 5 equivalent weights of a polyisocyanate selected from the group consisting of toluene diisocyanate, ethylene diisocyanate, phenyl diisocyanate, 4,4'-dipenyl methane diisocyanate (MDI), a mixture of 4,4'-diphenyl isocyanate and its trifunctional cyclic adduct container carbondiimide linkages, 1,5-naphtalene diisocyanate, xylene diisocyanate, tetramethylene diisocyanate, and hexamethylene diisocyanate; whereby sheet molding compounds containing the improved dual thickening system have improved shrink characteristics and better viscosity index properties enhancing the moldability of the resin and quality of the products made using the improved resin.

4,535,111
HEAT SENSITIZING AGENTS, THE PRODUCTION AND USE THEREOF

Hermann Perrey, Krefeld, and Martin Matner, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,907
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1983, 3330197
Int. Cl.³ C08K *5/16*; C07C *125/06*
U.S. Cl. 524—199 **6 Claims**

1. Heat sensitizing agents corresponding to the general formula I



wherein
R_1 and R_2 independently represent C_2–C_4alkylene or C_3–C_4cycloalkylene,

R_3, R_4 and R_5 independently represent optionally substituted alkylene, cycloalkylene or arylene,
R_6,R_7,R_8 and R_9 independently represent hydrogen or methyl,
R_{10} represents C_1–C_{18}alkyl, C_6–C_{18}aryl, C_7–C_{18}aralkyl or C_2–C_{18}alkenyl,
n represents the values 0 to 50,
m represents the values 1 to 4
x represents the values 5 to 100, and
y represents the values 0 to 100.

4,535,112

CATION EXCHANGE ELECTROLYTIC CELL MEMBRANES AND METHOD FOR MAKING AND REPAIRING

G. Howard McCain, Painesville; Leo L. Benezra, Mentor, and Craig E. Finch, Chagrin Falls, all of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.

Continuation of Ser. No. 318,967, Nov. 6, 1981, abandoned. This application Sep. 21, 1983, Ser. No. 534,375
Int. Cl.³ C08J *5/22*
U.S. Cl. 524—233 **7 Claims**

1. A patching compound for use in repairing an electrolytic cell membrane made from a perfluorocarbon copolymer formed by copolymerization of at least one fluorinated vinyl monomer and at least one monomer having a structure corresponding to CF_2=CFX, CF_2CFR_1X or CF_2=$CFOR_1X$ wherein R_1 is a bifunctional perfluorinated group containing at least 2 to 8 carbon atoms, and X is a pendant functional group selected from sulphonyl fluoride, carbonyl fluoride, sulphonate esters, carboxylate esters, sulphonamides and metal, ammonium or amine salts of sulphonate or carboxylate functional groups said copolymer having an equivalent weight of between 1000 and 1500 in the intermediate sulphonyl fluoride form whenever said functional groups are predominantly sulphonyl types and between 900 and 1500 in the intermediate carbonyl fluoride form whenever said functional groups are predominantly carbonyl types, comprising a dispersion of (a) about 5 to 25 weight percent of a patching perfluorocarbon copolymer meeting the specifications just given hereinabove for the aforesaid membrane copolymer in (b) a dispersion medium capable of at least partially solvating both of said perfluorocarbon copolymers, and, when said functional groups are predominantly sulphonyl types, said dispersion medium is selected from the group consisting of halocarbon oil, perfluorooctanoic acid, perfluorodecanoic acid, perfluorotributylamine, perfluorotrialkylamine, perfluoro-1-methyldecalin, decafluorobiphenyl, pentafluorophenol, pentafluorobenzoic acid, N-butylacetamide, tetrahydrothiophene-1,1-dioxide, N,N-diethyl acetamide, N,N-dipropylacetamide, N,N-dimethylformamide, 1-methyl-2-pyrrolidinone, diethyl glycol, ethylacetamidoacetate, 1cyclohexyl-2-pyrrolidinone, glycerine, ethyl-hexyl-diphenylyphosphate, and mixtures thereof, whereas when said functional groups are predominantly carbonyl types, said dispersion medium is selected from halocarbon oil, perfluorooctanoic acid, perfluorodecanoic acid, N-butylacetamide and mixtures thereof.

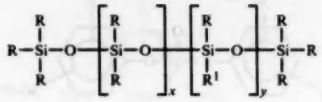
4,535,113

OLEFIN POLYMER COMPOSITIONS CONTAINING SILICONE ADDITIVES AND THE USE THEREOF IN THE PRODUCTION OF FILM MATERIAL

George N. Foster, Bloomsbury, N.J., and Richard B. Metzler, Briarcliff Manor, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Mar. 13, 1984, Ser. No. 587,007
Int. Cl.³ C08K *5/54*
U.S. Cl. 524—262 **28 Claims**

1. An extrudable composition comprising an olefin polymer and a silicone additive having the formula:



wherein each R is an alkyl radical, R^1 is a monovalent organic radical containing at least one ethylene oxide group, vicinal epoxy group or amino group and x and y each have a value of at least 1, said silicone additive being present in an amount sufficient to improve mechanical and/or optical properties.

4,535,114

COATING MATERIAL FOR USE ON SULFUR VULCANIZED RUBBER

Michael Kaniecki, Kent; Samuel P. Landers, Uniontown, and Thomas J. Botzman, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 620,346, Jun. 13, 1984, Pat. No. 4,515,199. This application Sep. 20, 1984, Ser. No. 652,170
Int. Cl.³ C08K *5/01, 5/02, 5/07*
U.S. Cl. 524—364 **22 Claims**

1. A liquid coating material for use on a pre-vulcanized rubber article containing free sulfur comprising: a rubber cement that contains unvulcanized diene rubber, the total weight of said rubber being not greater than 10% of the weight of said liquid coating material; 0.1 to 10 phr of a sulfur rubber vulcanization accelerator; and 1 to 500 phr of particulate metallic particles that can pass through a number 325 mesh U.S. Standard Sieve, said liquid coating material being substantially free of carbon black and free sulfur.

4,535,115

METHOD OF PREPARATION OF POLYIMIDE ACIDS

Kiran R. Bakshi, Murrysville; Walter P. Barie, Glenshaw, and Edward T. Sabourin, Allison Park, all of Pa., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1984, Ser. No. 642,519
Int. Cl.³ C08L *79/08*
U.S. Cl. 524—376 **12 Claims**

1. A one-step method for preparing a solution of an aromatic polyimide acid which comprises:

reacting an aromatic dianhydride with an approximately equimolar quantity of an aromatic diamine to produce a polyimide acid in the presence of a solvent comprising diglyme and an amount of a co-solvent sufficient to maintain said polyimide acid in solution, said co-solvent having the formula:

ROH

where R can be H, an aliphatic branched or straight-chain hydrocarbon having from 1 to 5 carbon atoms or a methoxy substituted aliphatic branched or straight-chain hydrocarbon having from 1 to 5 carbon atoms.

4,535,116

INHIBITION OF WATER TREEING IN POLYMERS OF ETHYLENE

Timothy W. Johnson, and Dennis S. Banasiak, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 26, 1983, Ser. No. 536,055
Int. Cl.³ C08K *5/05*
U.S. Cl. 524—385 **16 Claims**

1. A method for inhibiting formation of water trees in objects formed from compositions of polymers of ethylene used in dielectric applications comprising admixing a polymer of ethylene having a density in a range above about 0.92 g/cc as

determined by ASTM D1505 with an amount of an aliphatic, primary, monohydric, branched chain alkanol of about 9 to about 30 carbon atoms sufficient to inhibit formation of water trees in objects formed from compositions of polymers of ethylene used in dielectric applications, said alkanol defined by the formula

$$RCH_2CHCH_2OH$$
$$R'$$

wherein R and R' are the same or different linear or branched chain alkyl groups with each group containing from about 3 to about 20 carbon atoms.

4,535,117

STABILIZATION OF POLYPHENYLENE SULFIDE

Ronald D. Mathis, and Jerry O. Reed, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 2, 1983, Ser. No. 548,049

The portion of the term of this patent subsequent to Nov. 29, 2000, has been disclaimed.

Int. Cl.³ C08K *5/09*

U.S. Cl. 524—397 **20 Claims**

1. A polymer composition exhibiting improved heat stability comprising an arylene sulfide polymer containing an effective stabilizing amount sufficient to retard polymer curing and cross-linking of at least one group IA and IIA metal sorbate.

4,535,118

HIGH CLARITY, LOW HAZE POLYESTERS HAVING REDUCED INFRARED HEAT-UP TIMES

Brian W. Pengilly, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 538,681, Oct. 3, 1983, Pat. No. 4,476,272, which is a continuation-in-part of Ser. No. 351,841, Feb. 24, 1982, Pat. No. 4,408,004. This application Oct. 5, 1984, Ser. No. 658,329

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.³ C08L *67/02*

U.S. Cl. 524—398 **20 Claims**

1. A high clarity, low haze polyester, comprising: a polyester, said polyester having a small amount of an infrared absorbing material therein wherein said infrared absorbing material is carbon black, wherein the amount of said carbon black present is less than 10 parts by weight per million parts by weight of said polyester, wherein said carbon black has an average particle size of from 10 to 500 nanometers, and wherein said high clarity, low haze polyester has a Hunter value of less than 4.0 as measured on a bottle made therefrom having a cross-sectional thickness of about 0.028 inch.

4,535,119

RUBBER COMPOSITION FOR COATING TIRE CORD

Teruo Tanibuchi, Ichihara; Koji Ishiguchi, Chiba, and Shinji Yamamoto, Yotsukaido, all of Japan, assignors to 501 UBE Industries, Ltd., Ube, Japan

Filed May 4, 1984, Ser. No. 606,970

Claims priority, application Japan, May 6, 1983, 58-78306

Int. Cl.³ C08K *3/04*

U.S. Cl. 524—496 **3 Claims**

1. A rubber composition for coating a tire cord comprising:

(A) a reinforced rubber composition comprising vulcanizable rubber having dispersed therein 5 to 100 parts by weight per 100 parts by weight of vulcanizable rubber, of fine short fibers of thermoplastic polymer having

$$-CNH-$$
$$\|$$
$$O$$

groups in the polymer molecule, said vulcanizable rubber and said thermoplastic polymer being grafted to each other through a phenol formaldehyde resin precondensate at an interface of the fiber;

(B) a diene rubber;

(C) carbon black; and

(D) 0.1 to 10 parts by weight, per 100 parts by weight of a total amount of the rubber constituents, of a cobalt salt of an organic carboxylic acid having 6 or more carbon atoms,

wherein the following conditions (i) to (iv) are satisfied:

(i) the amount of said thermoplastic polymer is 1 to 15 parts by weight per 100 parts by weight of the total amount of the rubber constituents;

(ii) the ratio of the rubber is such that the total amount of natural rubber or polyisoprene in the component (A) and the component (B) is 100% to 65% by weight;

(iii) the amount of the carbon black is 50 to 70 parts by weight per 100 parts by weight of the total amount of the rubber constituents; and

(iv) the vulcanizate derived from the rubber composition has a 100% modulus of at least 60 kg/cm2.

4,535,120

AQUEOUS DISPERSIONS OF VINYLIDENE CHLORIDE RESINS

Kazuhiko Hiyoshi; Norio Matsuura; Michiharu Matsuguchi, all of Nobeoka; Norio Onofusa, and Tadao Nishikage, both of Yokohama, all of Japan, assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 14, 1981, Ser. No. 301,806

Int. Cl.³ C08L *33/06*

U.S. Cl. 524—560 **1 Claim**

1. An aqueous dispersion of a vinylidene chloride resin obtained by emulsion polymerizing a mixture of vinylidene chloride as a major component, methyl methacrylate, methacrylonitrile, and methacrylic acid; said aqueous dispersion having an aqueous phase and a polymer solids phase, the polymer solids phase having polymerized therein from about 87 to about 93 mole percent vinylidene chloride based on polymer solids content, from about 13 to about 7 mole percent of a mixture of methyl methacrylate and methacrylonitrile, based on polymer solids content, and an amount of methacrylic acid, said amount together with a titratable amount of methacrylic acid comprising a total amount of methacrylic acid, the total amount being from 1×10^{-4} to about 3×10^{-4} moles of methacrylic acid per gram of polymer solids content, the titratable amount being an amount which exists in a form titratable with a 1/20 Normal aqueous solution of sodium hydroxide, the titratable amount not exceeding the lesser of (a) about 1.3×10^{-4} moles per grams of polymer solids content and (b) about 60 percent of the total amount of methacrylic acid.

4,535,121

FLOCKING ADHESIVE FOR FLEXIBLE SUBSTRATES

Riza N. Özelli, Stephanusstrasse 37, 4040 Neuss 22; Hans-Josef Hoffmann, Moehlenring 63, 4152 Kempen 1, and Hartmut Lippert, Geschwister-Scholl-Strasse 61, 4019 Monheim, all of Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,601

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1983, 3322695; Jan. 7, 1984, 3400340

Int. Cl.³ C08L *75/00*

U.S. Cl. 524—715 **11 Claims**

1. An adhesive composition for use in the electrostatic flocking of flexible substrates comprising

(a) at least one isocyanate-terminated polyurethane prepolymer,

(b) from about 10 to 80% by weight, based on the weight of component (a), of at least one reaction product of a polyfunctional epoxide with an aromatic diisocyanate, as an adhesion promoter, and, optionally, one or more of the following:
(c) an organic solvent,
(d) a dispersant, and
(e) other auxiliary materials.

4,535,122

WET ADHESION PROMOTERS FOR EMULSION POLYMERS

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plains, Ill.

Division of Ser. No. 511,993, Jul. 8, 1983, Pat. No. 4,487,941. This application Sep. 28, 1984, Ser. No. 655,544

Int. Cl.³ C08F *26/06*; C08L *39/04*

U.S. Cl. 524—809 **3 Claims**

1. An aqueous emulsion-copolymerized latex of copolymerized monoethylenically unsaturated monomers including from 0.1% to 10% of a copolymerizable monomer formed by reacting an omega aminoalkyl alkylene urea with about 0.9 up to about 1.3 molar proportions of a saturated monoepoxide to consume most or all of one of the two amino hydrogen atoms available on said alkylene urea, and then reacting with about 0.9 up to about 1.4 molar proportions of glycidyl acrylate, glycidyl methacrylate, or a mixture thereof in the presence of at least 0.02%, based on the total weight of the reactants present, of an inhibitor which retards the free-radical polymerization of ethylenic unsaturation, and phenothiazine.

4,535,123

RELEASABLE FILM FORMING COMPOSITIONS

Shosaku Sasaki, and Nobuo Kaiya, both of Ichihara, Japan, assignors to Toray Silicone Company, Limited, Tokyo, Japan

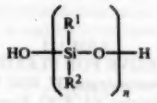
Division of Ser. No. 589,092, Feb. 15, 1984,. This application Aug. 23, 1984, Ser. No. 643,809

Claims priority, application Japan, Jun. 15, 1982, 57-102550; Jan. 7, 1983, 58-805

Int. Cl.³ C08L *83/04*

U.S. Cl. 524—862 **4 Claims**

1. A releasable film forming composition comprising:
(1) 100 parts by weight of a substantially straight-chain organopolysiloxane containing at least two silicon atom-bonded alkenyl groups per molecule and having a viscosity not lower than 1,000 centipoise at 25° C.;
(2) 5 to 80 parts by weight of a finely divided silica;
(3) 2 to 40 parts by weight of a phenyl-containing organosilane or organopolysiloxane represented by the general formula



wherein R^1 and R^2 are each a monovalent hydrocarbon group, at least 25 mol % of R^1 and R^2 being phenyl, and n is a number of 1 to 100;
(4) 0.5 to 40 parts by weight of an organohydrogenpolysiloxane containing at least two SiH groups per molecule, provided the sum of the number of alkenyl groups per molecule of the component (1) and that of SiH groups per molecule of the component (4) is at least five;
(5) a catalytic amount of a platinic compound; and
(6) an organic solvent.

4,535,124

THERMOPLASTIC POLYESTER MOULDING COMPOSITIONS WHICH HAVE GOOD IMPACT STRENGTH

Rudolf Binsack, Krefeld; Dieter Rempel, Leverkusen; Christian Lindner, and Leo Morbitzer, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 26, 1984, Ser. No. 624,576

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324398; Oct. 27, 1983, 3339001

Int. Cl.³ C08L *51/04*

U.S. Cl. 525—67 **9 Claims**

1. Thermoplastic moulding compositions comprising
(A) from 65 to 97% by weight (based on A + B) of thermoplastic polyester and
(B) from 3 to 35% by weight (based on A + B) of the graft product
of at least one vinyl monomer selected from styrene, acrylonitrile and methyl methacrylate on particle-shaped, at least partially cross-linked diene rubbers and/or alkyl acrylate rubbers having an average rubber particle diameter of from 0.05 to 1 μm, the graft products having a rubber content of from 60 to 85%, by weight, characterised in that the graft products B are produced on the basis of a mixture of
a. from 20 to 80% by weight (based on a+b) of a rubber latex having a particle diameter d_{50} of from 0.05 to 0.19 μm, and
b. from 80 to 20% by weight (based on a+b) of a rubber latex having a particle diameter d_{50} of from 0.2 to 1.0 μm
with the limitation that
(1) d_{50}(b) is larger than d_{50}(a) by a factor of from 1.5 to 8,
(2) the quotient $Q=(d_{90}-d_{10})/d_{50}$ of the particular rubbers is at most 2, and
(3) the difference d_{10}(b) − d_{90}(a) is from 0.01 to −0.10.

4,535,125

HIGH FLOW PROPYLENE POLYMER COMPOSITIONS

J. Douglas McCullough, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 13, 1983, Ser. No. 541,624

Int. Cl.³ C08L *23/26, 53/00*

U.S. Cl. 525—88 **12 Claims**

1. A composition having a melt flow between about 5 and about 50 dg/min (ASTM D1238-Condition L), and a high impact value, said composition being obtained by visbreaking the blend of 50–95% by weight of an impact-modified propylene polymer and 5–50% by weight of a linear low density ethylene copolymer, wherein:
(a) said impact-modified propylene polymer has a melt flow (ASTM D1238-Condition L) of about 0.5 to 15 dg/min and an elastomeric propylene-ethylene copolymer content of 5–50% by weight, the copolymer fraction having an ethylene content of 30–95% by weight, which propylene polymer is the product of sequential polymerization of propylene and a propylene-ethylene mixture over a titanium halide-containing coordination catalyst; and
(b) said linear low density ethylene copolymer is the product of polymerization of ethylene with up to 15 mole percent of at least one C_3–C_8 alpha olefin monomer over a transition metal-based coordination catalyst and which has a density in the range from 0.912 to 0.940 and a melt index (ASTM D1238-Condition E) in the range from 1 to 7.

4,535,126

AIR DRYING COATING COMPOSITION

Shinji Iida, Hiratsuka, Japan, assignor to Kansai Paint Company, Ltd., Hyogo, Japan

Filed Jun. 5, 1984, Ser. No. 617,564
Claims priority, application Japan, Jun. 10, 1983, 58-104664
Int. Cl.[3] C08F *8/00*
U.S. Cl. 525—106 7 Claims

1. In an air drying coating composition comprising a resinous binder, the improvement wherein the resinous binder comprises a mixture of (A) 9% to 91% by weight of a silicone-modified alkyd resin, a silicone-modified acrylic-grafted alkyd resin and/or a silicone-modified acrylic resin, the silicone modification of the alkyd, acrylic-grafted alkyd and acrylic resins being achieved by reacting said resin with a silicone resin having a reactive group selected from hydroxyl and alkoxy in the molecule and (B) 91% to 9% by weight of a carboxyl group-containing chlorinated polyolefin resin.

4,535,127

POLYACETAL COPOLYMERS AND PROCESS FOR PRODUCTION THEREOF

Kazuhiko Matsuzaki, and Minoru Hamada, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 13, 1984, Ser. No. 588,971
Claims priority, application Japan, Mar. 23, 1983, 58-47114; Jul. 12, 1983, 58-126792; Aug. 15, 1983, 58-147960
Int. Cl.[3] C08F *8/28;* C08L *61/02*
U.S. Cl. 525—154 18 Claims

1. A polyacetal copolymer composed of an acetal polymer portion and a thermoplastic elastomer portion having soft segments and hard segments, the second-order transition temperature of said elastomer portion being in the range of from −120° to 40° C.

4,535,128

POLYCARBOXYLIC-ALKYLENEIMINE RESINOUS COMPOSITION AND COATING COMPOSITION CONTAINING SAME

Hirotoshi Umemoto, 138-97, Oneo Hirono-cho, Uji-shi, Kyoto-fu; Hisaki Tanabe, B-40-508, Ishishiro 1 Otokogomo Yawata-shi, Kyoto-fu, and Shinji Nakano, 95-401, Tonda-danchi 1319, Makita-cho, Osaka-fu, Takatsuki-shi, all of Japan

Filed Dec. 30, 1983, Ser. No. 567,314
Claims priority, application Japan, Aug. 4, 1983, 58-142885
Int. Cl.[3] C08L *61/28*
U.S. Cl. 525—162 6 Claims

3. A coating composition being excellent in storage stability, time color stability and low temperature curing properties, comprising (C) a resinous composition having a resinous acid value based on carboxyl groups of a polycarboxylic acid whose titration midpoint potential in non-aqueous potentiometric titration is more than −300 mV in a state capable of developing a resinous acid value of 2 to 50, obtained by the reaction of (A) a basic resin having as essential functional groups both carboxyl groups derived from a polycarboxylic acid whose titration midpoint potential in non-aqueous potentiometric titration is more than −300 mV in a state capable of developing a resinous acid value and groups reactive with a crosslinking agent, and (B) an alkyleneimine compound having at least one alkyleneimine ring of 2 to 3 carbon atoms, in an amount equivalent to a resinous acid value of 0.01 to 50, and (D) a crosslinking agent, the solid weight ratio of (C) to (D) being 95–45 to 5–55.

4,535,129

HIGH IMPACT GRAFT COPOLYMERS OF METHYL ETHENYL BENZENE ON RUBBER BACKBONE

Frederick C. Schwab, Metuchen, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 200,116, Oct. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 870,782, Jan. 19, 1978, abandoned. This application Feb. 12, 1982, Ser. No. 348,464
Int. Cl.[3] C08F *279/02*
U.S. Cl. 525—316 17 Claims

1. A high impact copolymer comprising a preformed backbone polymer chain and multiple branches of polymeric methyl ethenyl benzene grafted to the backbone polymer, said polymeric methyl ethenyl benzenes being derived from a polymerizable mixture of isomers of methyl ethenyl benzene consisting essentially of:
1-methyl-4-ethenyl benzene, at least 85 weight percent;
1-methyl-3-ethenyl benzene, less than 15 weight percent; and
1-methyl-2-ethenyl benzene, 0 to 0.1 weight percent;
said copolymer having greater flow, at injection molding temperatures of 260° C. and above, than the corresponding high impact copolymer of the same Melt Index in which styrene is the grafted monomer instead of said isomers of methyl ethenyl benzene.

4,535,130

COSMETOLOGICAL POLYMERS

Claude Favié, and Michel Mercadier, both of Pau, France, assignors to Societe Nationale Elf Aquitaine (Production), France

Division of Ser. No. 317,532, Nov. 2, 1981, Pat. No. 4,435,545, Continuation of Ser. No. 93,511, Nov. 13, 1979, abandoned. This application Jul. 25, 1983, Ser. No. 516,809
Claims priority, application France, Nov. 21, 1978, 78 32742; Nov. 21, 1978, 78 32743
Int. Cl.[3] C08F *8/34*
U.S. Cl. 525—327.3 16 Claims

1. An epoxy bridge opened polymer selected from the group consisting of polyolefin and a polymer or copolymer of an acrylate or methacrylate in which 16–90% of the epoxy bridge carbon atom pairs have an active group attached to one carbon atom thereof and the adjacent epoxy carbon atom carries a hydroxyl group, and in which the remaining epoxy bridge carbon atom pairs have a hydroxyl group bonded to one carbon atom thereof and the adjacent epoxy carbon atom carries a halogen, hydroxy, amine, mercaptan or mercaptocarboxylate group, wherein said active group is a cinnamic acid, methoxycinnamic acid or salicylic acid moiety.

4,535,131

PROCESS FOR PRODUCING PARTIALLY HYDROLYZED ACRYLAMIDE POLYMER

Ryoji Handa, Yokosuka; Jun Hosoda, and Norimasa Yoshida, both of Yokohama, all of Japan, assignors to Nitto Kagaku Kabushiki Kaisha; Mitsubishi Rayon Co., Ltd. and Diafloc Co., Ltd., all of Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 596,102
Claims priority, application Japan, Apr. 4, 1983, 58-59055
Int. Cl.[3] C08F *8/12*
U.S. Cl. 525—369 10 Claims

1. In a process for producing a partially hydrolyzed acrylamide polymer which comprises mixing small pieces of the aquagel of an acrylamide polymer with an alkali agent and then drying the mixture thereby to produce a partially hydrolyzed acrylamide polymer, the improvement comprising maintaining said small pieces of the aquagel mixed with said alkali agent at a temperature of 50° to 95° C. for a time sufficient to effect hydrolysis to a degree of 1.1 to 3 times the theoretical hydrolysis percentage corresponding to the amount of the alkali agent mixed and until the hydrolysis is substantially completed, and thereafter drying said small pieces of the aquagel.

4,535,132

THERMOSETTING HIGH SOLIDS SOLVENT-BASED POLYESTER POLYOL COATING COMPOSITIONS

Ronald R. Ambrose, Allison Park; Wen-Hsuan Chang, Gibsonia; David T. McKeough, Gibsonia; Delano R. Ealinger, Gibsonia, and Samuel Porter, Jr., Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 12, 1983, Ser. No. 560,688
Int. Cl.[3] C08L 67/02
U.S. Cl. 525—443 19 Claims

1. A high solids, solvent-based, thermosetting coating composition having a sprayability of at least 40 percent which when cured is flexible and hard in that when the coating composition is deposited on an elastomeric substrate and cured, the coated substrate can be bent around a ½-inch mandrel with the coating facing outwardly and the coating exhibits substantially no breaks or cracks when tested at 35° F.; and in that when the coating composition is deposited on a metallic substrate and cured, the coated substrate has a Sward hardness of at least 14; said coating composition contains a film-former consisting essentially of a polyester polyol and a curing agent; the polyester polyol has a hydroxyl value of at least 50 and comprises from about 10 to 35 percent cyclic moieties.

4,535,133

POLYETHER POLYOLS MODIFIED WITH EPOXY RESIN-DIAMINE ADDUCTS

Michael Cuscurida, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,435
Int. Cl.[3] C08G 59/14, 18/48, 18/58
U.S. Cl. 525—504 20 Claims

1. A modified polyether polyol being produced by the process comprising adding an epoxy resin-diamine adduct to a polyether polyol during the reaction of an alkylene oxide with a polyol initiator.

4,535,134

METHOD AND APPARATUS FOR CONTROLLING THE DISCHARGE OF PRODUCT FROM VAPOR PHASE POLYMERIZATION OF MONOMERS IN A HORIZONTAL STIRRED-BED REACTOR

Mark X. de Lorenzo, Webster; Charles R. Hoffpauir; Johnnie R. Hutchins, both of Alvin; Timmy R. Meyer, Webster; John E. Page, Friendswood, and Michael E. Poehl, Lake Jackson, all of Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 31, 1983, Ser. No. 480,833
Int. Cl.[3] C08F 2/34
U.S. Cl. 526—88 13 Claims

1. A method for discharging polymeric product in powdered form from the take-off end of a horizontal vapor phase polymerization stirred-bed reactor comprising the steps of:

(a) setting a rate for discharging powdered polymerized monomer when the reactor is operating in a steady state so as to maintain a powder level above a discharge port at the take-off end of the reactor; and

(b) actuating a take-off zone discharge apparatus at the set rate for removing powdered polymerized monomer from the discharge port below the powder level;

thereby reducing gas blowby.

4,535,135

ASSOCIATIONS OF BASES, RESULTING FROM THE COMBINATION OF A LITHIUM ALKYL OR ARYL WITH AN ALKALI METAL AMIDE OR HYDRIDE, POLYMERIZATION PROCESS IN WHICH THEY ARE USED, AND PRODUCT OBTAINED

Serge L. M. B. Lecolier, Janville Sur Juine, and Serge F. Raynal, Draveil, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Division of Ser. No. 340,078, Jan. 18, 1982, Pat. No. 4,435,312.
This application Oct. 24, 1983, Ser. No. 544,807
Claims priority, application France, Jan. 19, 1981, 81 00854
Int. Cl.[3] C08F 4/48
U.S. Cl. 526—174 11 Claims

1. Process for the polymerisation or copolymerisation of vinylic, heterocyclic or diene monomers capable of undergoing anionic polymerisation by the opening of an ethylenic double bond or an heterocyclic ring, wherein said monomers are initiated, in the presence or absence of a solvent, with an association of bases, of formula:

$$n'RLi—nMZ$$

wherein n and n' are the numbers of mols of each compound, R is alkyl or aryl, M is sodium or potassium and Z is an hydride or an inorganic amide, the ratio n/n' being between 0.2 and 50.

4,535,136

FLUOROOLEFIN POLYMERIZATION PROCESS USING ACYL HYPOFLUORITE CATALYST

Robert C. Wheland, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Apr. 23, 1984, Ser. No. 603,289
Int. Cl.[3] C08F 2/00, 214/18, 4/32
U.S. Cl. 526—214 16 Claims

1. A process for polymerizing one or more olefin monomers, at least one of which is fluorinated, comprising contacting said monomers with a fluoroxy compound solution of at least one fluoroxy compound, said solution containing an acyl hypofluorite compound of the formula RCOOF and having a fluoroxy compound concentration of at least 0.5 meq/liter; said concentration containing, based on the total number of equivalents of fluoroxy compounds present, about 35 to 100% of RCOOF; other fluoroxy compounds in said solution having the formulae RCF_2OF and $RCF(OF)_2$; wherein for each occurrence R is $X(CF_2)_n—$, n is 1 to 16, and X is H or F, provided that X is F when n is 4 or less.

4,535,137

METHOD FOR MAKING A SALT FREE SOLID POLYMER FROM A POLYMER EMULSION

Werner Siol, Darmstadt; Hubert Rauch, Weiterstadt, and Guenter Fleck, Darmstadt-Arheilgen, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 9, 1982, Ser. No. 448,407
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3149941
The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.
Int. Cl.[3] C08F 2/00
U.S. Cl. 526—216 7 Claims

1. A method for making a solid polymer product containing less than 0.01 percent of salt by weight of said polymer, which method comprises dispersing monomers in an aqueous phase with from 0.01 to 2 percent, by weight of the polymer solids produced, of an emulsifier consisting essentially of a free emulsifier acid which is a long chain activated carboxylic acid or an acidic phosphate ester, phosphite ester, or phosphonic acid having a long chain alkyl group in the molecule, said free emulsifier acid having a pK_a between 1.0 and 4.5, whereby an emulsion of said monomers is formed, free radically polymerizing said monomers in the absence of strong acids with an

initiator which is free of salt and which will not form a salt in the course of the claimed method, whereby a stable polymer emulsion is formed, and then precipitating the polymer from said stable polymer emulsion by the addition thereto of a sufficient amount of a strong acid.

4,535,138

SILANE ESTER CONTACT LENS COMPOSITION, ARTICLE AND METHOD OF MANUFACTURE

Donald J. Ratkowski, Mesa, and Ping-Chang Lue, Scottsdale, both of Ariz., assignors to Paragon Optical, Inc., Mesa, Ariz.

Filed Nov. 1, 1982, Ser. No. 438,904

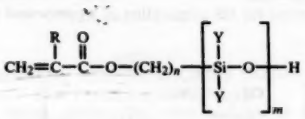
The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.³ C08F *30/08, 130/08, 230/08*

U.S. Cl. 526—279 **8 Claims**

1. A copolymer composition especially adapted for use in fabricating a contact lens comprising a copolymer of comonomers including the product resulting when

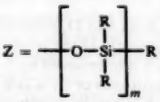
(a) about 5–60 parts by weight of a silane ester containing a silanol functionality of and having the structure:



wherein:

R=CH_3— and H—;

X,Y=C_1–C_6 alkyl, phenyl and Z;

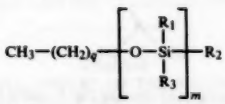


n=1–3

m=1–2

is mixed with 4–15 parts by weight of

(b) an alkylalkoxysilane of the structure



wherein R_1, R_2, and R_3=C_1–C_6 alkyl, and q=0 or 1; said alkylalkoxysilane being present in the mixture in an amount of less than a stoichiometric proportion with respect to said hydroxy silane ester; and

(c) about 80–20 parts by weight of a C_1–C_{20} alkyl acid ester selected from the group consisting of acrylic and methacrylic acid.

4,535,139

POLYMERS CONTAINING SULPHONYL AND CARBOXYLIC ESTER GROUPS

Wolfgang Bräuer; Siegfried Korte, both of Leverkusen; Theo Neukam, Dormagen, and Carlhans Süling, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,682

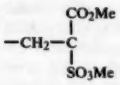
Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219641

Int. Cl.³ C08F *228/02*

U.S. Cl. 526—287 **4 Claims**

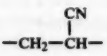
1. A polymer comprising:

(A) 0.1 to 80 mole percent of polymerized units corresponding to the following formula



and,

(B) 20 to 99 mole percent of polymerized units of 1 or more comonomer corresponding to the formula



said polymer selected from the group consisting of

(1) from 89 to 99.9 mole percent of acrylonitrile and from 0.1 to 11 mole percent of 2-methoxysulphonyl propenoic acid methyl ester,

(2) from 90 to 99.8 mole percent of acrylonitrile, from 0.1 to 6 mole percent of methyl acrylate and from 0.1 to 4 mole percent of 2-methoxysulphonyl propenoic acid methyl ester and,

(3) from 40 to 89.9 mole percent of acrylonitrile, from 0.1 to 15 mole percent of 2-methoxysulphonyl propenoic acid methyl ester and from 10 to 59.9 mole percent of vinyl chloride or vinylidene chloride.

4,535,140

HOT-MELT ADHESIVES BASED ON VINYL POLYMER

Jules E. Schoenberg, Scotch Plains; Thomas P. Flanagan, Green Brook, and Dilip K. Ray-Chaudhuri, Bridgewater, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jul. 17, 1981, Ser. No. 284,162

Int. Cl.³ C08F *210/14;* **C09J** *00/00*

U.S. Cl. 526—329 **9 Claims**

1. A solvent-free 100 percent solid vinyl polymer hot melt adhesive comprising:

(a) 10–90% by weight of a C_1–C_{12} alkyl acrylate and

(b) 10–60% by weight of an alpha-olefin of C_{20}–C_{40}, wherein said alkyl acrylate is partially replaced with up to 60% by weight, based on the polymer, of vinyl acetate or with up to 10% by weight, based on the polymer, of a C_6–C_{12} olefin or with a mixture of vinyl acetate and C_6–C_{12} olefin, provided that the polymer in all instances contains at least 10% by weight of said alkyl acrylate.

4,535,141

LIQUID CURABLE POLYORGANOSILOXANE COMPOSITIONS

Loretta A. Kroupa, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 592,481, Mar. 23, 1984, abandoned. This application Dec. 13, 1984, Ser. No. 682,562

Int. Cl.³ C08G 77/06

U.S. Cl. 528—15 **12 Claims**

1. A curable liquid polyorganosiloxane composition consisting essentially of the product obtained by mixing (A) 100 parts by weight of at least one liquid triorganosiloxy endblocked polydimethylsiloxane, said triorganosiloxy radicals being selected from dimethylvinylsiloxy and methylphenylvinylsiloxy, where said polydimethylsiloxane exhibits a viscosity of from 1.0 to 500 Pa·s at 25° C.; (B) from 5 to 25 parts of a benzene-soluble copolymer consisting essentially of units of the formulae $CH_2{=}CH(CH_3)_2SiO_{\frac{1}{2}}$, $(CH_3)_3SiO_{\frac{1}{2}}$ and $SiO_{4/2}$, where the molar ratio of the combination of $CH_2{=}CH(CH_3)_2SiO_{\frac{1}{2}}$ and $(CH_3)_3SiO_{\frac{1}{2}}$ units to $SiO_{4/2}$ units is from 0.7:1 to 1.2:1, inclusive, and $CH_2{=}CH(CH_3)_2SiO_2$ units constitute from 2 to 8 percent by weight of said copolymer; (C) an organosiloxane of the formula $H(CH_3)_2SiO[Si(CH_3)_2O]_xSi(CH_3)_2H$, where x is an integer from 0 to 50, in an amount sufficient to provide at least 1.6 silicon-bonded hydrogen atoms per vinyl radical present in said composition; (D) a polyorganosiloxane containing at least three silicon-bonded hydrogen atoms per molecule in an amount sufficient to provide from 5 to 15 percent of the silicon-bonded hydrogen atoms present in (C) and (D), with the proviso that the total number of silicon-bonded hydrogen atoms present in (C) and (D) is from 1.8 to 2.9 times the number of vinyl radicals present in said composition; and (E) an amount of platinum catalyst sufficient to promote curing of said composition.

4,535,142

HIGH SOLIDS COATINGS BASED ON DIRICINOLEATE DERIVATIVES

Melvin Brauer, East Brunswick, and Dominic Simone, Lincroft, both of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Filed Jul. 10, 1984, Ser. No. 629,522

Int. Cl.³ C08G 18/36

U.S. Cl. 528—75 **23 Claims**

1. A low viscosity sprayable polyurethane coating composition comprising at least one diricinoleate diol and a polyisocyanate compound; said diricinoleate diol and said polyisocyanate compound being present in substantially stoichiometric amounts.

4,535,143

PROCESS FOR THE PREPARATION OF COPOLYCARBONATES OF SULFONYL DIPHENOL

Ronald L. Price, Moundsville, W. Va.; Mark W. Witman, and Sivaram Krishnan, both of Pittsburgh, Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 6, 1984, Ser. No. 637,945

Int. Cl.³ C08G 63/62

U.S. Cl. 528—174 **8 Claims**

1. A continuous process for the preparation of a copolycarbonate resin containing at least 15 wt. percent of at least one unit derived from an aromatic dihydroxy compound having at least one sulfonyl bridging group comprising a reaction between a mixture containing said aromatic dihydroxy compound and at least one sulfonyl-free aromatic dihydroxy compound and a carbonic acid precursor under the conditions of interfacial polycondensation characterized in that a quaternary salt at an amount sufficient to avoid formation of emulsion is present in the precondensation step and that a tertiary amine catalyst in a sufficient amount to effect the build-up of molecular weight is present in the secondary polycondensation step.

4,535,144

SYNTHESIS OF HIGH MOLECULAR WEIGHT POLYBENZIMIDAZOLE WITH ARYLHALO PHOSPHORUS COMPOUND CATALYST

Eui W. Choe, Randolph, and Anthony B. Conciatori, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 461,887, Jan. 28, 1983,. This application Jun. 27, 1984, Ser. No. 625,294

Int. Cl.³ C08G 73/18

U.S. Cl. 528—207 **2 Claims**

1. A two-stage polymerization process for the production of high molecular weight polybenzimidazole from at least one monomeric aromatic reactant having a pair of amine substituents in an ortho position relative to each other and a carboxylate ester group positioned on an aromatic nucleus, which comprises heating the reactant above the melting temperature thereof in a first stage melt polymerization zone in contact with a halophosphorus polymerization catalyst selected from arylhalophosphines or arylhalophosphites to provide a foamed prepolymer; and heating the prepolymer in a second stage solid state polymerization zone at a temperature above about 250° C. to produce high molecular weight polybenzimidazole product.

4,535,145

PROCESS FOR THE PREPARATION OF POLYESTERS FROM ALIPHATIC DICARBOXYLIC ACIDS AND POLYALKYLPIPERIDYL DIOLS

Eduard Troxler, Basel, Switzerland; Thomas Kainmüller, Lindenfels, and Rudolf Maul, Lorsch, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

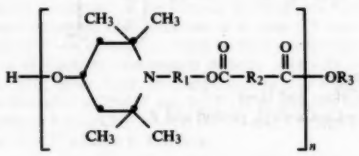
Filed Jun. 29, 1984, Ser. No. 626,507

Claims priority, application Switzerland, Jul. 8, 1983, 3765/83

Int. Cl.³ C08G 63/44, 73/16

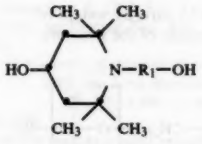
U.S. Cl. 528—289 **5 Claims**

1. A process for the preparation of a compound of the formula I



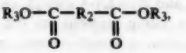
(I)

wherein n is a value from 8 to 25, preferably from 10 to 20, R_1 and R_2, each independently of the other, are C_1–C_{18}alkylene, C_2–C_{18}alkylene which is interrupted by —O—, —S— or —N(R)—, in which R is hydrogen or C_1–C_4alkyl, or are C_4–C_8alkenylene, and R_3 is C_1–C_4alkyl, by polycondensation of a diol of the formula II



(II)

with a dicarboxylic acid ester of the formula III



(III)

which process comprises stirring the reaction medium which contains an excess of 2 to 50 mol.%, based on the diol of the formula II, of the dicarboxylic acid ester of the formula III, in

the presence of at least 0.03 mol.%, of an oxide or of an organometal compound of a metal of the 4th main group or of the 4th auxiliary group of the Periodic Table, until the bulk of the alkanol of the formula R_3OH which forms during the reaction is distilled off, under a pressure of 0.7 to 1.3 bar, and thereafter stirring under a pressure of less than 10 mbar, in the temperature range from 100° to 170° C., and then working up the melt so obtained in conventional manner.

4,535,146

POLYESTER FORMULATIONS HAVING FLEXIBILITY PROPERTIES

Aram Mekjian, Hillsdale, N.J., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed May 7, 1984, Ser. No. 607,983

Int. Cl.³ C08G *63/54*

U.S. Cl. 528—295.3 **5 Claims**

1. Method of making an unsaturated polyester resin comprising (1) heating together, for about forty to about 100 minutes at a temperature between about 100° and 120° C. a mixture of about 85 moles of maleic anhydride, about 10 to about 20 moles of a dimer or trimer of a fatty acid having from 15 to 21 carbon atoms, about 15 to about 25 moles of dicyclopentadiene, and about 84–90 moles of water, (2) adding to the reaction mixture an additional 60 to 100 moles of dicyclopentadiene and continuing to maintain the reaction mixture for about 100 to about 140 minutes at temperatures between about 120° to about 140° C., and (d3) adding to the reaction mass about 50 to about 65 mole percent, based on the total polycarboxylic acid content (hydrolyzed maleic acid, fatty acid dimer, and fatty acid trimer) of a glycol having 2 to 6 carbon atoms and maintaining the mixture at temperatures between about 190° and 212° C. for about 12 to about 20 hours.

4,535,147

PHOSPHAZENE MODIFIED AMINE TERMINATED POLYMERS AND METHOD

Ronald E. Myers, Strongsville, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Jul. 9, 1984, Ser. No. 629,281

Int. Cl.³ C08G *69/26*

U.S. Cl. 528—321 **14 Claims**

1. A composition of matter comprising: a reaction product of (a) an amine terminated reactive liquid polymer and (b) a phosphazene; the phosphazene being one of cyclical or straight chained having at least 3 but not more than 20 phosphorous atoms and including at least one amine reactive phosphorous substituent, the reactive liquid polymer having a backbone including at least one polymerized vinylidene monomer selected from a group consisting of: (a) monoolefins having between 2 and 14 carbon atoms; (b) dienes having between 4 and 10 carbon atoms; (c) vinyl and allyl esters; (d) vinyl and allyl ethers and (e) acrylates of the form CH_2=CH-COOR", R" being: hydrogen, an alkyl radical of not more than 18 carbon atoms, or an alkoxyalkyl, alkylthioalkyl or cyanoalkyl radical having not more than 12 carbon atoms.

4,535,148

POLYGLYCIDYL ETHERS OF TRICYCLODECANE AND CURED EPOXY RESINS THEREFROM

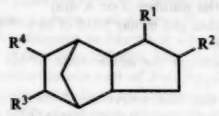
Elizabeth J. Gladfelter, St. Paul; Edgar R. Rogier, Minnetonka, and Edward D. DiDomenico, Anoka, all of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Aug. 1, 1984, Ser. No. 636,645

Int. Cl.³ C08G *59/34, 59/32*

U.S. Cl. 528—365 **24 Claims**

1. A composition of matter comprising a polyglycidyloxy compound having the structural formula:



wherein R^1, R^2, R^3 and R^4 are selected from the group consisting of hydrogen, hydroxyl and glycidyloxy radicals, provided that at least three of R^1, R^2, R^3 and R^4 are glycidyloxy radicals.

12. An epoxy resin formed by reacting a polyglycidyloxy containing composition in accordance with claim 1 with an epoxy curing agent.

4,535,149

PROCESS FOR THE PRODUCTION OF POLYARYLENE SULPHIDES

Wolfgang Ebert; Rolf-Volker Meyer; Karsten-Josef Idel, and Rolf Dhein, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,957

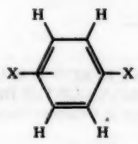
Claims priority, application Fed. Rep. of Germany, May 17, 1983, 3317821

Int. Cl.³ C08G *75/14*

U.S. Cl. 528—388 **10 Claims**

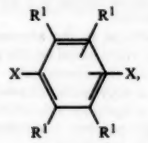
1. A process for the production of optionally branched, high molecular weight polyarylene sulphides, from

(a) dihalo-benzenes, of which from 0 to 100 mol % correspond to formula (I)



(I)

and from 0 to 100 mol % correspond to formula (II)



(II)

wherein each

X represents a halogen which is in the meta- or para-position with respect to the other and

R^1 is the same or different, and represent hydrogen, C_1–C_{20} alkyl, C_5–C_{20} cycloalkyl, C_6–C_{24} aryl, C_7–C_{24} alkaryl or C_7–C_{24} aralkyl, or two radicals R^1 which are in the ortho-position with respect to one another linked to form an aromatic or heterocyclic 5 to 10-membered ring which contains up to three heteroatoms, and at least one radical R^1 is always different from hydrogen, and

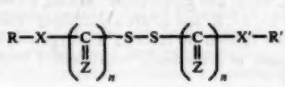
(b) from 0 to 5.0 mol %, based on the total of the dihalogen aromatic compounds corresponding to formulae (I) and (II), of a tri- or tetrahalogen aromatic compound corresponding to formula (III)

$$ArHal_n \quad \text{(III)},$$

wherein

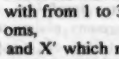
Ar represents an aromatic or heterocyclic radical which contains up to three heteroatoms, and has from 6 to 24 carbon atoms,

Hal represents halogen, and
n represents the number 3 or 4, and
(c) alkali sulphides, the molar ratio of (a+b):c ranging from 0.85:1 to 1.14,
(d) in a polar solvent the molar ratio of (c) to (d) ranging from 1:2 to 1:15,
characterized in that the above-mentioned components are reacted together in the presence of disulphides corresponding to formmula (IV)



(IV)

wherein
R and R' which are the same or different, represent C_1–C_{20} alkyl, C_5–C_{20} cycloalkyl, C_6–C_{24} aryl or C_7–C_{24} aralkyl, and in the case of the cycloalkyl, or aryl or aralkyl radicals with from 1 to 3 ring carbon atoms replaced by heteroatoms,
X and X' which may be the same or different, represent a single bond, O, S or



wherein R^2 represents hydrogen and has the meaning stated for R,
Z which is the same or different, represents O, S, NR, wherein R is as defined above, and
n represents 0 or 1.

4,535,150

PROCESS FOR PREPARING EPOXY RESINS HAVING LOW HYDROLYZABLE CHLORINE CONTENTS

Joe M. Hunter, Fern Creek, Ky., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 4, 1984, Ser. No. 677,711
Int. Cl.³ C08G *59/14*
U.S. Cl. 528—489 **10 Claims**

1. A process for preparing epoxy resins having low hydrolyzable chlorine content which comprises
(a) dissolving the epoxy resin in a solvent in the amount of about 50 to about 95 weight percent resin based on the total weight of resin and solvent wherein the epoxy resin is a derivative of epichlorohydrin and a polyhydric alcohol or polyhydric phenol and which has a hydrolyzable chlorine content of at least about 0.07 weight percent, and wherein the solvent is isopropanol or secondary butanol;
(b) adding aqueous alkali metal hydroxide in the amount of about 1.2 to about 33 equivalents of hydroxide per hydrolyzable chlorine equivalent of the epoxy resin; and
(c) heating the reactants at an elevated temperature for a time sufficient to reduce the hydrolyzable chlorine content to the desired level.

4,535,151

PROCESS FOR THE WET GRANULATION OF ORGANIC PIGMENTS IN AN AQUEOUS SYSTEM WITH HYDROLYSIS OF ACETIC ANHYDRIDE, PROPIONIC ANHYDRIDE OR A MIXTURE THEREOF

Pierre L. E. Fournier, Sotteville-Lés-Rouen, France, assignor to I.C.I. Francolor S.A., Clamart, France

Continuation of Ser. No. 377,094, May 11, 1982, abandoned. This application May 16, 1984, Ser. No. 610,935
Claims priority, application France, Jun. 25, 1981, 81 12494
Int. Cl.³ C09B *5/00, 46/00, 47/00, 57/04*
U.S. Cl. 534—739 **12 Claims**

1. In a process for the wet granulation of pigment particles to form granules by stirring said pigment in a multi-phase system comprising water and an organic solvent which is incompletely miscible with water, the improvement wherein the organic solvent is an easily hydrolyzable compound selected from the group consisting of acetic anhydride, propionic anhydride and mixtures thereof, whereby, after agglomeration of the solid particles of the pigment, the initial multiphase liquid medium is converted into a homogeneous aqueous phase containing the granules suspended therein.

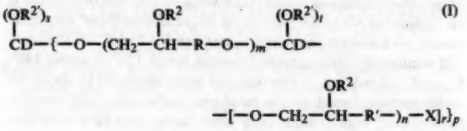
4,535,152

WATER SOLUBLE CYCLODEXTRIN POLYMERS SUBSTITUTED BY IONIC GROUPS AND PROCESS FOR THE PREPARATION THEREOF

József Szejtli; Éva Fenyvesi; Béla Zsadon; Mária Szilasi, and Lajos Décsei, all of Budapest, Hungary, assignors to Chinoin, Gyogyszer Es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Feb. 14, 1984, Ser. No. 580,098
Claims priority, application Hungary, Feb. 14, 1983, 488
Int. Cl.³ C08B *37/16*
U.S. Cl. 536—103 **14 Claims**

1. Process for the preparation of water soluble cyclodextrin polymers substituted by ionic groups, containing structural units of formula (I)



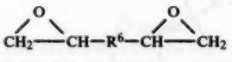
(I)

wherein
CD stands for a group obtained from α-, β- or γ-cyclodextrin by a cleaving p+s or 1+t+r hydroxy group,
R and R' stand independently for —CH_2—, —CHOH—CH_2—, —CH_2—O—$(CH_2)_2$—O—CH_2—CHOH—CH_2—, —CH_2—O—CH_2—CHOH—CH_2—, —CH_2—O—$(CH_2)_4$—O—CH_2—CHOH—CH_2—,
X stands for a secondary or tertiary amino or —OR^1 or —OR^2, wherein
R^1 stands for hydrogen or when r is other than O, a group obtained from α-, β-, or γ-cyclodextrin by cleaving a hydroxy group,
R^2 are the same or different and stand for hydrogen, —PO$(OH)_2$—, —SO_2OH—, —R^3—$(COOH)_u$, —R^3—$(SO_2OH)_u$, —R^3—$(NR^4R^5)_u$, or a group obtained from α-, β- or γ-cyclodextrin by cleaving a hydroxy group or one, two or three R^2 substituents together from an R^3—NR^4—R^3— or $(—R^3—)_3N$ group,
$R^{2'}$ has the same meaning as R^2 excepting the groups obtained from cyclodextrin molecules,
R^3 stands for u+1 groups obtained from an alkane or an aliphatic hydrocarbon having 1 to 10 carbon atoms, the end carbon atom standing nearer to the polymeric chain of which is unsubstituted or substituted by an oxo group,
R^4 and R^5 stand independently for hydrogen, alkyl having 1 to 4 carbon atoms unsubstituted or substituted by halogen, aryl having 6 to 10 carbon atoms or aralkyl or alkylaryl groups being obtainable by the combination thereof,
m and n stand independently for an integer from 1 to 10,
r stands for an integer from 0 to 23,
p stands for an integer from 1 to 24,
s and t stand independently for an integer from 0 to 7,
u stands for an integer from 1 to 5,
wherein m, n, r, t, and u can differ also in the side-chains within a unit and when
CD stands for a group obtained from α-cyclodextrin, then p+s≦18 and r+5 ≦17 and when
CD stands for a group obtained from β-cyclodextrin, then p+s≦21 and r+t≦20 and when

CD stands for a group obtained from γ-cyclodextrin, then $p+s \leqq 24$ and $r+t \leqq 23$,

or the aqueous solutions thereof characterized in that

(a) calculated on 1 mole of the cyclodextrin, the α-, β- or γ-cyclodextrin is reacted with 0.1 to 7 moles of a halogen derivative of formula $R^{2''}$-Hal, wherein Hal stands for halogen and $R^{2''}$ has the same meaning as $R^{2'}$ except hydrogen, $-PO(OH)_2$ and $-SO_2OH$, or 0.1 or 7 moles of a sulfone derived from a hydroxy sulfonic acid of formula $HO-R^3-SO_2OH$, wherein R^3 has the same meaning as defined above, in the presence of 0.2 to 14 moles of an alkali metal or an alkali-earth metal hydroxide in 0.7 to 1.0 liter of water, the reaction mixture containing the cyclodextrin substituted by ionic groups is reacted calculated on 1 mole of the cyclodextrin contained therein with 5 to 15 moles of epichlorohydrin or a bisepoxy derivative of formula (II)



(II)

wherein R^6 stands for a direct bond or $-CH_2-O-CH_2-$, $-CH_2-O-CH_2-CH_2-O-CH_2-$ or $-CH_2O-(CH_2)_4-O-CH_2-$.

after adding 5 to 15 moles of an alkali metal or alkali-earth metal hydroxide and 1.8 to 2.5 liter of water at a temperature of 40° to 80° C., or

(b) calculated on 1 mole of the cyclodextrin the α-, β- or γ-cyclodextrin is reacted with 0.1 to 7 moles of a halogen derivative of formula $R^{2''}$-Hal, wherein $R^{2''}$ and Hal have the same meanings as defined above, or a sulfone derived from a hydroxy sulfonic acid of formula $HO-R^3-SO_2OH$, wherein R^3 has the same meaning as defined above, or a primary or secondary amine or a hydroxy compound of formula $R^{2''}-OH$, wherein $R^{2''}$ has the same meaning as defined above, as well as with 5 to 15 moles of epichlorohydrin or a bis epoxy derivative of formula (II), wherein R^6 has the same meaning as defined above, in the presence of 5 to 20 moles of an alkali metal or alkali-earth metal hydroxide and 2.5 to 3.5 liter of water, or

(c) claculated on 1 mole of the cyclodextrin the α-, β- or γ-cyclodextrin is reacted with 5 to 15 moles of an alkali metal or alkali-earth metal hydroxide, 2.5 to 3.5 liter of water and 5 to 15 moles of epichlorohydrin or a bisepoxy derivative of formula (II), wherein the cyclodextrin polymer solution obtained is reacted calculated on 1 mole of the cyclodextrin contained therein with 0.1 to 7 moles of a halogen derivative of formula $R^{2''}$-Hal, wherein $R^{2''}$ and hal have the same meanings as defined above, or a sulfone derived from a hydroxy sulfonic acid of formula $HO-R^3-SO_2OH$, wherein R^3 has the same meaning as defined above, in the presence of 0.2 to 14 moles alkali metal or alkali-earth metal hydroxide, or

(d) for preparing cyclodextrin polymers having structural units of formfula (I), which contain on place of R^2 and/or $R^{2'}$ the inorganic or organic acyl groups stated above, the α-, β- or γ-cyclodextrin is reacted, calculated on 1 mole of the cyclodextrin with 5 to 15 moles of an alkali metal or alkali-earth metal hydroxide, 2.5 to 3.5 liter of water and 5 to 15 moles of epichlorohydrin or bisepoxy derivative of formula (II), wherein R^6 has the same meaning as defined above, and the cyclodextrin polymer obtained is reacted under heating with the corresponding inorganic or organic acid anhydride in the presence of an organic solvent and/or acid binding agent or with the salt of the corresponding acid in the absence of an organic solvent and/or acid binding agent, and

from the reaction mixture containing the cyclodextrin polymer substituted by ionic groups, obtained by anyone of the processes (a) to (d) the by-products of low molecular weight, the salts dissolved and the water are removed and so the solid polymer is obtained.

4,535,153

HETEROPOLYSACCHARIDE S-88

Kenneth S. Kang, LaJolla, and George T. Veeder, San Diego, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 355,934, Mar. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 256,625, Apr. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 73,575, Sep. 7, 1979, abandoned. This application Mar. 8, 1984, Ser. No. 587,736

Int. Cl.³ C08B *37/00*; C12P *19/06*

U.S. Cl. 536—123 **3 Claims**

1. Heteropolysaccharide S-88, which is principally carbohydrate, comprising 3–7% (calculated as O-acetyl) O-acyl groups, said O-acyl groups being primarily O-acetyl and O-formyl and substantially free of O-succinyl, 11.8–18.7% glucuronic acid, and the neutral sugars mannose, glucose, and rhamnose in the approximate molar ratio 1:2:2, wherein the ratio of terminally linked rhamnose to 1,4 linked rhamnose is 2:1 and the mannose is principally 1,4 linked.

4,535,154

REDUCTIVE DESTRUCTION OF NITROSAMINES, HYDRAZINES, NITRAMINES, AZO- AND AZOXY-COMPOUNDS

Larry K. Keefer, Bethesda, and George Lunn, Frederick, both of Md., assignors to United States of America, Washington, D.C.

Continuation of Ser. No. 282,844, Jul. 13, 1981, abandoned. This application Jul. 13, 1983, Ser. No. 513,249

Int. Cl.³ C07D *295/00*; C07C *85/11*

U.S. Cl. 544—106 **24 Claims**

1. A single stage process for reducing the toxicity and the carcinogenic potential of the class of suspected carcinogenic compounds characterized by having at least two nitrogens bonded together within the molecule by conversion to the corresponding amine which comprises reducing said compounds with a nickel-aluminum alloy in a hydroxide solution in the absence of a hydrogen atmosphere, at room temperature and at atmospheric pressure, whereby destruction of the nitrogen-nitrogen bond is greater than 99% complete.

4,535,155

METHOD FOR SEPARATING CEPHALOSPORINS

Kiyoshi Nara, Kyoto; Kazuyoshi Katamoto, Suita, and Kazuhiko Ohta, Ikeda, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 220,727, Dec. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 74,808, Sep. 11, 1979, abandoned. This application Aug. 11, 1983, Ser. No. 522,549

Claims priority, application Japan, Sep. 14, 1978, 53-113096

Int. Cl.³ C07D *501/12*

U.S. Cl. 544—20 **15 Claims**

1. A method for isolating at least two members selected from the group consisting of cephalosporin C, desacetylcephalosporin C and desacetoxy-cephalosporin C from each other as contained in a crude aqueous solution of said members, which comprises contacting the crude aqueous solution with activated carbon to adsorb the said members in the solution on the carbon, and eluting the adsorbed members fractionally with water containing 0 to 20 percent (V/V) of an organic solvent or a mixture of organic solvents in the order of:

desacetyl-cephalosporin C if present;

desacetoxy-cephalosporin C if present;

cephalosporin C if present.

4,535,156

CHROMOGENIC CEPHALOSPORIN COMPOUND

Jürgen Blumbach, Frankfurt am Main, and Peter Schindler, Mörfelden-Walldorf, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 236,539, Feb. 20, 1981,. This application Dec. 29, 1983, Ser. No. 565,847

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006889

Int. Cl.³ C07D *501/36*; A61K *31/545*

U.S. Cl. 544—26 **1 Claim**

1. 7-β-thien-2-yl-acetamido-3-[(4-nitro-carboxyphenyl)-thiomethyl]-3-cephem-4-carboxylic acid.

4,535,157

PROCESS FOR MAKING 6-DESOXY-6-METHYLENENALOXONE AND 6-DESOXY-6-METHYLENENALTREXONE

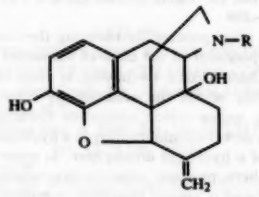
Peter C. Meltzer, Lexington, and Jotham W. Coe, Belmont, both of Mass., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Nov. 1, 1983, Ser. No. 547,676

Int. Cl.³ C07D *489/08*

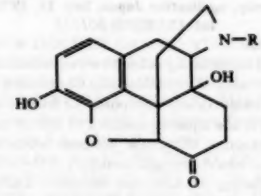
U.S. Cl. 546—44 **3 Claims**

1. A method of preparing a 6-desoxy-methylene compound of the formula



wherein R is $CH_2CH{=}CH_2$ or

which comprises combining approximately equal molar amounts of potassium t-butoxide and methyltriphenylphosphonium formide to form a mixture and adding to that mixture tetrahydrofuran and stirring at about 20° C. for about 0.5 hours and then reacting with a compound of the formula



at about 20° C. for about 40 minutes and stirring for about 1.25 hours and decomposing the reaction mixture by the addition of water in the presence of ammonium chloride and recovering the resultant 6-desoxy-6-methylene compound.

4,535,158

OPTIONALLY N-SUBSTITUTED AMINODESOXY-1.4;3.6-DIANHYDROHEXITOL DERIVATIVES

Klaus Klessing, Ettlingen, Fed. Rep. of Germany, assignor to Willmar Schwabe GmbH & Co., Karlsruhe, Fed. Rep. of Germany

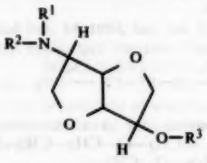
Division of Ser. No. 285,358, Jul. 20, 1981, Pat. No. 4,413,122. This application Sep. 19, 1983, Ser. No. 533,538

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028288

Int. Cl.³ C07D *473/08, 473/10, 473/34, 493/04*

U.S. Cl. 544—118 **43 Claims**

1. Aminodesoxy-1.4;3.6-dianhydrohexitol derivatives of the general formula



(I)

wherein R^1 and R^2, together with the nitrogen atom to which they are attached,

(a) signify the aden(9)yl radical possibly mono or disubstituted on the 6-amino group or

(b) the 6-alkylmercaptopurin(9)yl radical or

(c) the theophyllin(7)yl radical or

(d) the 6-chloropurin-9-yl radical or wherein

R^1 signifies a hydrogen atom or a lower alkyl group with 1 to 4 carbon atoms and

R^2 an ω-theophyllin(7)ylalkyl radical or an ω-theobromin-1-ylalkyl radical or an ω-(N,N'-di-lower alkyl-substituted xanthin-N''-yl)-alkyl radical, whereby lower alkyl signifies an alkyl group with 1 to 5 carbon atoms, or an ω-adenin-9-ylalkyl radical, whereby the alkyl radical has 2 to 7 carbon atoms and can be straight chained or branched, and wherein

R^3 signifies a hydrogen atom, a methanesulphonyl or toluenesulphonyl group,

as well as their acid addition salts.

4,535,159

PROCESS FOR PRODUCING 1-POSITION AMINO-DERIVATIVES OF 1-(3',4'-METHYLENEDIOXYPHENYL)PROPANE-2-OL

Ernesto Forné ; Rafael Foguet; Aurelio Sacristán, and José A. Ortiz, all of Barcelona, Spain, assignors to Ferrer Internacional, S.A., Barcelona, Spain

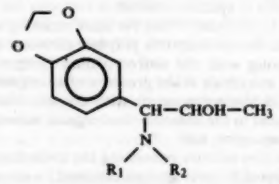
Filed Apr. 30, 1982, Ser. No. 374,593

Claims priority, application Spain, May 13, 1981, 502.470

Int. Cl.³ C07D *413/00, 403/00, 317/44*

U.S. Cl. 544—148 **18 Claims**

1. A compound selected from the group consisting of 1-position amino derivatives of 1-(3',4'-methylenedioxyphenyl)-propane-2-ol having the formula



I

wherein R_1 and R_2 are each independently selected from the group consisting of hydrogen, alkyl having a maximum of 2

carbon atoms, cycloalkyl having 3 to 6 carbon atoms and benzyl, provided that R_1 and R_2 are not both hydrogen, cycloalkyl or benzyl and where R_1 and R_2 taken together with the nitrogen atom to which they are attached can form a ring having 5 to 7 bonds, which ring may contain another heteroatom selected from the group of oxygen and nitrogen and wherein said ring can be substituted with a member selected from the group consisting of benzyl and hydroxyl; and the non-toxic acid addition salts thereof.

2. A compound according to claim 1 designated d,l-erythro-1-(3',4'-methylenedioxyphenyl)-1-morpholine-propane-2-ol.

14. A therapeutic composition having analgesic activity comprising an analgesically effective amount of a compound according to claim 1 as active ingredient in admixture with a pharmaceutically acceptable carrier.

17. Method of inducing analgesia in a mammal comprising administering an analgesically effective amount of a compound according to claim 1.

4,535,160
PROCESS FOR OBTAINING SOLID CYANURIC CHLORIDE IN FINELY DIVIDED FORM

Stefan Elischer, Münchsmünster; Hans-Günther Höbel, Aiglsbach; Robert Merkt, and Fritz Wagner, both of Münchsmünster, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Jul. 31, 1984, Ser. No. 636,335

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336993

Int. Cl.³ C07D *251/28*

U.S. Cl. 544—191 **12 Claims**

1. A process for recovering solid cyanuric chloride from the cyanuric chloride vapour obtained by trimerizing cyanogen chloride comprising the steps of separately introducing the cyanuric chloride vapour and cold air into a separation chamber through obliquely upwardly directed inlets in the chamber, in such a manner that an intensive mixing up of the cyanuric chloride vapour with the cold air takes place after emergence from the inlet pipes to precipitate solid cyanuric chloride from the vapor, withdrawing cyanuric chloride-free waste gases from the upper part of the separation chamber and removing the precipitated solid cyanuric chloride from the lower part of the separation chamber.

4,535,161
BENZOQUINOLIZINE DERIVATIVES

Isao Hayakawa, Tokyo, Japan, assignor to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

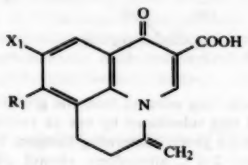
Filed Jun. 27, 1983, Ser. No. 507,635

Claims priority, application Japan, Dec. 10, 1982, 57-216545

Int. Cl.³ C07D *401/10*

U.S. Cl. 546—94 **5 Claims**

1. A benzoquinolizine derivative of formula (I)



(I)

wherein:

X_1 represents a hydrogen atom or a halogen atom and R_1 represents a 4- to 7-membered saturated cyclic amino group selected from the group consisting of a 1-azetidinyl, a substituted pyrrolidinyl, 1-piperidinyl, 1-piperazinyl and 4-morpholinyl which may be substituted with one or more substituents selected from the group consisting of hydroxyl group, amino group, alkyl group, mono- or dialkylamino group, hydroxyalkyl group and aminoalkyl group, wherein the alkyl moiety in said one or more substituents contains 1 to 6 carbon atoms, a nitrogen atom of said cyclic amino group being bonded to the benzoquinolizine moiety, and physiologically acceptable salts thereof.

5. A compound as claimed in claim 1, wherein X_1 is a fluorine atom and R_1 is a 3-amino-1-pyrrolidinyl group.

4,535,162
PROCESS FOR CATALYTICALLY REDUCING NITROAROMATIC COMPOUNDS

Giovanni Mestroni; Grazia Zassinovich, both of Trieste, and Enzo Alessio, Gorizia, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jun. 16, 1983, Ser. No. 504,748

Claims priority, application Italy, Jun. 21, 1982, 21953 A/82

Int. Cl.³ C07D *215/38, 211/72, 239/02*

U.S. Cl. 546—159 **6 Claims**

1. A process for catalytically reducing nitroaromatic compounds by displacement of hydrogen from carbon monoxide and water or from synthesis gas to nitroaromatic compounds, such reduction being catalyzed by complexes of rhodium, iridium, ruthenium and osmium; characterized in that the $CO+H_2O$ system or the $(CO+H_2)+H_2O$ system is reacted with a nitroaromatic compound of formula;

$$Ar—(NO_2)_x \quad (I)$$

wherein Ar is an aryl group or a hetero-aryl group, optionally substituted by inert groups; x is an integer selected from 1 to 3, in the presence of a complex catalyst having the formula:

$$[MChel(L)_2]+X^- \quad (II)$$

or of a catalyst composed by carbonyl compounds and chelants of formula:

$$Mz(CO)_y+nChel \quad (III)$$

wherein M = Rh, Ir, Ru, Os; "Chel" is a chelating bidentate or tridentate aromatic nitrogen compound selected from the group consisting of 2,2'-dipyridyl, 4,4'-dimethyl-2,2'dipyridyl, 1,10-phenanthroline, 5,6-dimethyl-1,10-phenanthroline, 2,9-dimethyl-1,10-phenanthroline, 4,7-dimethyl1,10-phenanthroline, 3,4,7,8-tetra-methyl-1,10-phenanthroline, 3,4,5,6,7,8-hexamethyl-phenanthroline, 2,3,4,7,8,9-hexamethyl-phenanthroline, 2,4,7,9-tetramethylphenanthroline, sulphonated phenanthrolines, N,N,N'N'-ortho-phenylene diamine and N,N,N',N'-ortho-phenylene diamine and N,N,N',N'-1,8-diaminonaphthalene and terpyridyl; "L" is a molecule of carbon monoxide or of an olefin or half a molecule of a diolefin; X^- is an anion selected from Cl^-, Br^-, I^-, PF_6^-, BF_4^-, $(B(C_6H_5)_4$, $^-CO_3^{--}$ and HCO_3^-; z and y, are integers and n is an integer or a fractional number, at temperatures ranging from about 25° C. to 250° C., at a carbon monoxide pressure ranging from 1 to 150 atmospheres.

4,535,163
2-AMINOALKYL-PYRIDINE DERIVATIVES

George S. Sach, Welwyn, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

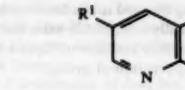
Division of Ser. No. 391,077, Jun. 22, 1982, Pat. No. 4,444,772. This application Feb. 2, 1984, Ser. No. 576,244

Claims priority, application United Kingdom, Jun. 12, 1981, 8119906

Int. Cl.³ A61K *31/44*; C07D *213/38*

U.S. Cl. 546—300 **8 Claims**

1. A compound of the formula:



or a salt thereof; where R^1 is C_{1-4} alkyl; R^2 is C_{3-4} alkoxy; halogen, or amino; and R^3 is a C_{1-3} alkylene group.

4,535,164

PROCESS FOR PREPARING CERTAIN SUBSTITUTED 4-THIAZOLIDINONES

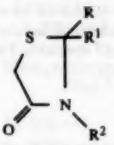
Robert M. Di Pardo, Lansdale, and Mark G. Bock, Hatfield, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 312,607, Oct. 19, 1981, abandoned. This application Mar. 30, 1983, Ser. No. 478,272

Int. Cl.³ C07D *277/34*

U.S. Cl. 548—187 **5 Claims**

1. A process for preparing compounds of the formula:



wherein

R and R_1 are independently H; or C_1–C_8 alkyl; phenyl; or $-(CH_2)_n-A-R^3$ wherein:

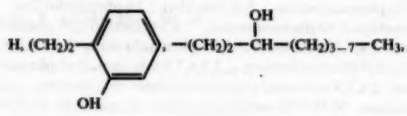
R^3 is carboxy, a carboxy salt, a carboxy ester of the formula $COOR^5$ wherein R^5 is C_{1-10} alkyl;

A is p-phenylene, m-phenylene or subsituted phenylene derivative in which one or two of the phenylene hydrogens is replaced by methyl, halo, or 2,5-furylene; and

n is 3 or 4;

and

R^2 is



phenyl, phen-C_1–C_8-straight chain alkyl or

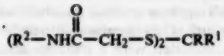
wherein:

Z is alkylene or unsaturated alkylene having from 2–3 carbon atoms;

R^6 is hydrogen or lower alkanoyl;

R^5 is hydrogen or straight chain C_{1-3} alkyl; and

R^4 is lower straight chain or branched alkyl having from 3–7 carbon atoms, an unsaturated alkyl having from 3–7 carbon atoms, or a substituted lower alkyl selected from polyfluoro alkyl of from 3–7 carbon atoms and lower alkoxy methylene; or R^4 and R^5 taken together with the carbon atom connecting R^4 and R^5 is a cyclic substituent selected from a bridged or unbridged alicyclic ring of from 5–9 carbon atoms or a heterocyclic ring containing oxygen and from 5–7 ring-forming carbon atoms such that at least one of R, R^1 and R^2 is other than H which comprises cyclizing a compound of the formula:



in an aprotic reaction medium in the presence of a Hg^{+2} metal catalyst.

4,535,165

SUBSTITUTED DIAZOLES AND THIAZOLES

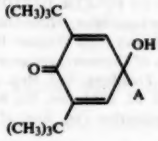
George G. I. Moore, Houlton, Wis., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Division of Ser. No. 324,063, Nov. 23, 1981,. This application Nov. 16, 1983, Ser. No. 552,407

Int. Cl.³ C07D *277/24, 231/12, 233/64*

U.S. Cl. 548—204 **5 Claims**

1. A compound of the formula



wherein A is a monofunctional diazole or thiazole radical selected from the group consisting of a 1-N-methylpyrazole radical which is bonded to the cyclohexadien-1-one ring via a carbon atom which is alpha to a nitrogen atom of the pyrazole ring, a 1-N-methylimidazole radical which is bonded to the cyclohexadien-1-one ring via a carbon atom which is alpha to a nitrogen atom of the imidazole ring, and a thiazole radical which may be optionally substituted by a single halogen or methyl radical.

4,535,166

PROCESS FOR PREPARING ALPHA-ARYLALKANOIC ACIDS

Graziano Castaldi, Briona, and Claudio Giordano, Vicenza, both of Italy, assignors to Zambon S.p.A., Vicenza, Italy

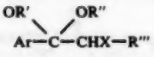
Filed Aug. 3, 1983, Ser. No. 520,131

Claims priority, application Italy, Aug. 6, 1982, 22760 A/82; Mar. 7, 1983, 19930 A/83

Int. Cl.³ C07C *67/333*

U.S. Cl. 548—204 **6 Claims**

1. A process for preparing an alpha-arylalkanoic acid or a salt thereof, which comprises the rearrangement of an alpha-halo-alkylarylketal of formula



wherein

Ar is an aromatic ring selected from the group comprising (a) a phenyl ring substituted by one or two substituents slected from the group comprising halogen, 1–6 C alkyl, 1–4 C alkoxy, 2–4 C alkenyloxy, phenyl, phenoxy, dichlorophenoxy, dichloroanilino, benzoyl, indolinyl, dihydropyrrolyl, thenoyl (b) a naphthyl ring substituted by one or two substituents selected from the group comprising halogen and 1–4 C alkoxy (c) a pyrrolyl ring substituted by one or two radicals selected from the group comprising 1–4 C alkyl and alkyl$_{1-4}$ C-phenyl, (d) chlorocarbazolyl, (e) benzoxazolyl substituted by one chlorophenyl radical, and (f) thiazolyl substituted by one or two radical selected from the group comprising phenyl and chlorophenyl and (g) thienyl,

R′ and R″, independently from each other, are a satured or unsatured, straight or branched alkyl radical having from 1 to 12 C atoms or, when taken together, are a satured or unsatured straight or branched alkylene radical having from 2 to 12 C atoms which completes an alicyclic ring having from 5 to 7 members;

X is halogen;

R‴ is hydrogen, alkyl having from 1 to 6 C atoms or cycloalkyl having from 3 to 7 C atoms. in neutral or weakly alkaline conditions and in the presence of a polar-protic medium and the subsequent hydrolysis of the thus obtained ester in the same reaction medium to afford the corresponding alpha-arylalkanoic acid or a salt thereof.

4,535,167

CHIRAL, N-PROTECTED, N-SUBSTITUTED α-AMINO ACIDS

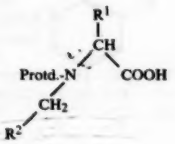
Roger M. Freidinger, Hatfield, Pa., assignor to Merck & Co. Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 330,634, Dec. 14, 1981, abandoned. This application May 23, 1983, Ser. No. 497,301

Int. Cl.[3] **C07C** *125/065, 103/46*

U.S. Cl. 548—344 **4 Claims**

1. A process for preparing chiral, N-protected, N-substituted α-amino acids of Formula III:



III

wherein

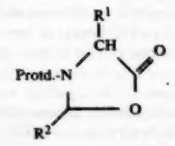
(a) R^1 is loweralkyl, hydroxyloweralkyl, mercaptoloweralkyl, aminoloweralkyl, mono- or di-loweralkylaminoloweralkyl, loweralkylthioloweralkyl, phenyl, benzyl, phenylloweralkyl, p-hydroxybenzyl, indolylloweralkyl, phthalimidylloweralkyl, imidazolylloweralkyl, benzyloxyloweralkyl, guanidinoloweralkyl, carboxyloweralkyl and loweralkylcarboxyloweralkyl;

(b) R^2 is loweralkyl, straight or branched C_1–C_{22} alkyl, cycloloweralkyl, benzyl, phenyl, and phenylloweralkyl, carboxyloweralkyl, loweralkoxycarbonylloweralkyl and carboxyloweralkylaminoloweralkyl;

(d) Protd, is an N-protecting group selected from the group consisting of 9-fluorenylmethoxycarbonyl, trifluoroacetyl, 4-toluenesulfonylethyloxycarbonyl, carbobenzoxy, 2-chlorocarbobenzoxy, methylsulfonyl-ethyloxycarbonyl, 2-(triphenylphosphino)-ethoxycarbonyl, and 2-cyano-t-butyloxycarbonyl;

which comprises

treating an N-protected oxazolidinone of Formula II:



II

with a selective reducing agent.

4,535,168

PREPARATION OF INDOLINE-2-CARBOXYLIC ACID VIA THE INTERMEDIATE INDOLINE-2-CARBOXYLIC ACID ESTER TIN COMPLEX

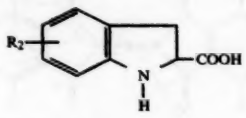
Charles J. Guinosso, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Feb. 3, 1983, Ser. No. 463,430

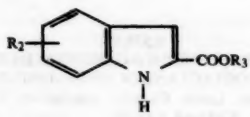
Int. Cl.[3] **C07D** *209/18*

U.S. Cl. 548—402 **4 Claims**

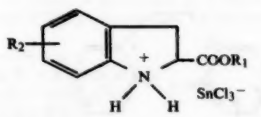
1. A process for producing an indoline-2-carboxylic acid of the formula:



wherein R_2 is hydrogen, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, or halogen, which process comprises (a) contacting an indole-2-carboxylic acid or ester of the formula:



wherein R_2 is as defined above and R_3 is hydrogen or R_1 (R_1 being alkyl of 1–4 carbon atoms) with dry hydrogen chloride gas and stannous chloride in an alkanol of the formula R_1OH at atmospheric pressures for a period of 2 to 24 hours at temperatures between −25° C. and +25° C., (b) contacting the resulting indoline-2-carboxylic acid ester tin complex of the formula:



II

wherein R_1 and R_2 are as defined above, which is dissolved in an alkanol solvent of 1–3 carbon atoms, with an aqueous potassium or sodium hydroxide solution, and (c) acidifying the resulting solution.

4,535,169

5H-6-OXO-2,3,4,4A,7,7A-HEXAHYDROPYRANO[2,3-B]PYRROLE AND THE PREPARATION THEREOF

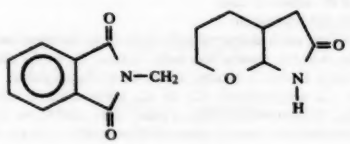
John L. Krstenansky, Tucson, Ariz., and Bruce L. Currie, Woodridge, Ill., assignors to The Board of Trustees of the University of Illinois, Urbana, Ill.

Filed Sep. 12, 1983, Ser. No. 530,992

Int. Cl.[3] **C07D** *471/04*

U.S. Cl. 548—453 **2 Claims**

1. A compound having the structure



4,535,170

FLAME RETARDANTS AND COMPOSITIONS CONTAINING THEM

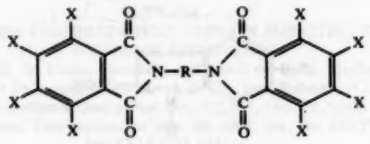
Joseph Sonnenberg, San Jose, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 760,664, Sep. 18, 1968,. This application Sep. 21, 1980, Ser. No. 77,494

Int. Cl.³ C07D *209/48*

U.S. Cl. 548—462 **5 Claims**

1. A bisimide compound of the formula



wherein each X is independently bromine or hydrogen with the proviso that at least 4 of said X's are bromine, and R represents an alkylene radical of 2 to 18 carbon atoms.

4,535,171

DIBENZO[B,F]THIEPIN-3-CARBOXALDEHYDES AS PROSTAGLANDIN ANTAGONISTS

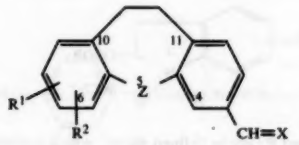
Joshua Rokach, Laval, Canada, assignor to Merck Frosst Canada, Inc., Kirkland, Canada

Continuation-in-part of Ser. No. 442,921, Nov. 18, 1982, abandoned, which is a continuation of Ser. No. 328,096, Feb. 25, 1981, abandoned, which is a continuation of Ser. No. 097,759, Nov. 27, 1979, abandoned. This application Oct. 11, 1983, Ser. No. 540,587

Int. Cl.³ C07D *337/14*

U.S. Cl. 549—12 **12 Claims**

1. A compound of the formula:



wherein

X is O, N—R^3, wherein R^3 is hydrogen, loweralkyl, aryl, hydroxy, loweralkoxy, loweracyloxy, amino or loweralkylamino; or X may have the formula:

wherein

Y and Z_1 are each independently O or S and

R^4 and R^5 are each independently hydrogen or loweralkyl; and the broken line represents a possible bond between R^4 and R^5 when R^4 and R^5 are not hydrogen;

R^1 and R^2 are each independently hydrogen, halogen including chloro, bromo, fluoro and iodo, amino, C_1 to C_4 alkanoyl, hydroxyl, C_1 to C_4 alkoxy, thiol, C_1 to C_4 alkylthio, C_1 to C_4 alkylsulfinyl, C_1 to C_4 alkylsulfonyl, trifluoromethyl, trifluoromethylthio, cyano, nitro, and C_1 to C_4 alkyl or dialkylamino, benzyl, phenethyl or hydroxyalkyl; and the dotted line indicates either an olefinic bond or saturation at the 10-, 11-position.

4,535,172

3(ETHER AND THIOETHER) 3'-(4-DIALKYLAMINOPHENYL) PHTHALIDES

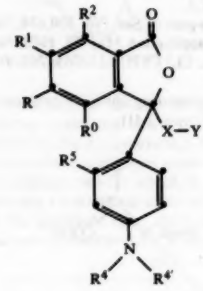
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to The Hilton-Davis Chemical Co., Cincinnati, Ohio

Filed Jan. 8, 1982, Ser. No. 338,008

Int. Cl.³ C07D *307/88*

U.S. Cl. 549—310 **8 Claims**

1. A 3-(X-Y)-3-(2-R^8-4-N-R^4-N-$R^{4'}$-aminophenyl)-4-R^0-5-R-6-R^1-7-R^2-phthalide having the formula

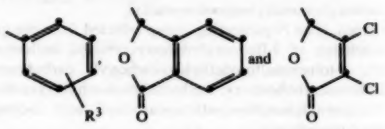


wherein:

R^0, R, R^1 and R^2 each represent hydrogen or halo or when R^0, R^2 and one of R and R^1 are each hydrogen the other of R and R^1 represents dialkylamino dibenzylamino or N-alkylbenzylamino in which alkyl is non-tertiary C_1 to C_4 alkyl and benzyl is substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl;

X represents oxygen or sulfur;

Y represents a non-tertiary C_1 to C_{16} alkyl or is selected from the group consisting of



in which

R^3 represents hydrogen, non-tertiary C_1 to C_8 alkyl, non-tertiary C_1 to C_4 alkoxy or halo;

R^4 and $R^{4'}$ may be identical or different and each represent non-tertiary C_1 to C_4 alkyl, benzyl or benzyl substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl; and

R^5 represents hydrogen, C_1 to C_3 alkyl, non-tertiary C_1 to C_4 alkoxy, halo, dialkylamino, dibenzylamino or N-alkylbenzylamino in which alkyl is non-tertiary C_1 to C_4 alkyl; and benzyl may be substituted in the benzene ring by one or two of halo or C_1 to C_3 alkyl.

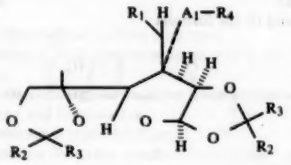
4,535,173

INTERMEDIATES FOR THE PRODUCTION OF PROSTAGLANDINS FROM D-GLUCOSE

Bruce A. Pearlman, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 13, 1982, Ser. No. 449,115
Int. Cl.[3] C07D 317/70, 317/44
U.S. Cl. 549—433 6 Claims

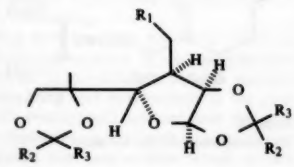
1. A prostaglandin intermediate of the formula A-6A



A-6A

wherein R_1 is
(a) $-CO_2M$, where M is a metal cation,
(b) —CN,
(c) $-CO_2R_2$,
(d) $-CONHR_2$,
(e) $-CON(R_2)_2$, wherein each R_2 is the same or different,
(f) $-CH{=}NR_3$,
(g) $-CHNOR_3$, or
(h) $-CHNN(R_3)_2$;
wherein R_2 is
(a) $(C_1\text{–}C_5)$alkyl, or
(b) $(C_6\text{–}C_{12})$aryl;
wherein R_3 is
(a) hydrogen,
(b) $(C_1\text{–}C_5)$alkyl, or
(c) $(C_6\text{–}C_{12})$aryl;
wherein A_1 is
(a) cis—$CH_2CH{=}CH{-}CH_2{-}(CH_2)_g{-}CH_2$—,
(b) cis—$CH_2CH{=}CH{-}CH_2{-}(CH_2)_g{-}CF_2$—,
(c) cis—$CH_2CH_2{-}CH{=}CH{-}(CH_2)_g{-}CH_2$—,
(d) $-(CH_2)_4{-}(CH_2)_g{-}CH_2$—,
(e) $-(CH_2)_4{-}(CH_2)_g{-}CF_2$—,
(f) $-CH_2CH_2{-}O{-}CH_2{-}(CH_2)_g{-}CH_2$—,
(g) $-CH_2C{\equiv}C{-}CH_2{-}(CH_2)_g{-}CH_2$—, or
(h) $-CH_2CH_2{-}C{\equiv}C{-}(CH_2)_g{-}CH_2$—;
wherein g is one, 2, or 3; and
wherein R_4 is
(a) hydrogen,
(b) halogen,
(c) $-OR_2$,
(d) $-OSO_2R_2$,
(e) $-OSi(R_2)_3$, wherein each R_2 is the same or different,
(f) $-CH(OR_2)_2$, wherein each R_2 is the same or different, or
(g) —CN.

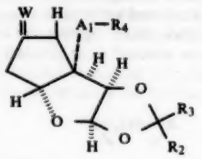
2. A compound of the formula A-5A



A-5A

wherein R_1 is
(a) $-CO_2M$, wherein M is a metal cation,
(b) —CN,
(c) $-CO_2R_2$,
(d) $-CONHR_2$,
(e) $-CON(R_2)_2$, wherein each R_2 is the same or different,
(f) $-CHNR_3$,
(g) $-CHNOR_3$, or
(h) $-CHNN(R_3)_2$;
wherein R_2 is
(a) $(C_1\text{–}C_5)$alkyl, or
(b) $(C_6\text{–}C_{12})$aryl; and
wherein R_3 is
(a) hydrogen,
(b) $(C_1\text{–}C_5)$alkyl, or
(c) $(C_6\text{–}C_{12})$aryl.

6. A compound of the formula A-11A,



A-11A

wherein A_1 is
(a) cis—$CH_2CH{=}CH{-}CH_2{-}(CH_2)_g{-}CH_2$—,
(b) cis—$CH_2CH{=}CH{-}CH_2{-}(CH_2)_g{-}CF_2$—,
(c) cis—$CH_2CH_2{-}CH{=}CH{-}(CH_2)_g{-}CH_2$—,
(d) $-(CH_2)_4{-}(CH_2)_g{-}CH_2$—,
(e) $-(CH_2)_4{-}(CH_2)_g{-}CF_2$—,
(f) $-CH_2CH_2{-}O{-}CH_2{-}(CH_2)_g{-}CH_2$—,
(g) $-CH_2C{\equiv}C{-}CH_2{-}(CH_2)_g{-}CH_2$—, or
(h) $-CH_2CH_2{-}C{\equiv}C{-}(CH_2)_g{-}CH_2$—;
wherein R_2 is
(a) $(C_1\text{–}C_5)$alkyl, or
(b) $(C_6\text{–}C_{12})$aryl;
wherein R_3 is
(a) hydrogen,
(b) $(C\text{–}C_5)$alkyl, or
(c) $(C_6\text{–}C_{12})$aryl;
wherein R_4 is
(a) hydrogen,
(b) halogen,
(c) $-OR_2$,
(d) $-OSO_2R_2$,
(e) $-OSi(R_2)_3$, wherein each R_2 is the same or different,
(f) $-CH(OR_2)_2$, wherein each R_2 is the same or different, or
(g) —CN; and
wherein W is divalent and is
(a) —H, $-SO_2(C_6H_5)$,
(b) —H, —CN,
(c) $=P(C_6H_5)$,
(d) —H, $-PO(C_6H_5)_2$,
(e) $CH_3CH(OCH_2CH_3)O$—, —CN,
(f) —H, $-SO_2CH_3$,
(g) $-CH_3S$—, CH_3S—,
(h) —H, $-NO_2$, or
(i) —H, $-SO(C_6H_5)$.

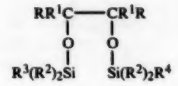
4,535,174

FREE-RADICAL INITIATORS AND METHOD FOR MAKING

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

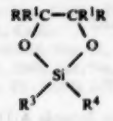
Filed Nov. 2, 1984, Ser. No. 667,931
Int. Cl.[3] C07F 7/08, 7/18
U.S. Cl. 556—443 6 Claims

1. Free-radical initiators selected from the class consisting of

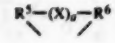


-continued

and



where R and R^1 are monovalent radicals selected from $C_{(6-13)}$ aryl hydrocarbon radicals and substituted $C_{(6-13)}$ aryl hydrocarbon radicals, and when joined together and attached to the same carbon atom are selected from divalent aryl radicals having the formula,



R^2 is a monovalent radical selected from hydrogen, $C_{(1-8)}$ alkyl, $C_{(1-8)}$ haloalkyl, $C_{(1-8)}$ alkoxy or $C_{(6-13)}$ aryl, R^3 is selected from $C_{(2-20)}$ aliphatically unsaturated hydrocarbon radicals, substituted $C_{(2-20)}$ aliphatically unsaturated monovalent hydrocarbon radicals, $C_{(4-20)}$ cycloaliphatic unsaturated hydrocarbon radicals and substituted $C_{(4-20)}$ cycloaliphatic unsaturated hydrocarbon radicals and R^4 is selected from R^2 radicals and R^3 radicals and R^5 and R^6 are selected from divalent $C_{(6-13)}$ aryl hydrocarbon radicals and substituted $C_{(6-13)}$ aryl hydrocarbon radicals, X is selected from —O—, —S—, $—CH_2—$ and

and a is 0 or 1.

4,535,175

FLUORODIOXOLES

Edward N. Squire, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 18, 1984, Ser. No. 601,590
Int. Cl.³ C07D *317/00*
U.S. Cl. 549—455 **10 Claims**

1. A fluorodioxole having the following formula

wherein Y is hydrogen or chlorine; Z is hydrogen, fluorine, or chlorine; and R is fluorine or the trifluoromethyl group; with the proviso that when one of Y and Z is hydrogen, the other one of Y and Z is other than chlorine; and when R is trifluoromethyl, only one of Y and Z can be hydrogen.

10. A dioxolane having the formula

wherein R is fluorine and Y is hydrogen or chlorine.

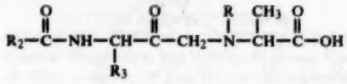
4,535,176

INTERMEDIATES FOR SUBSTITUTED PEPTIDE COMPOUNDS

Sesha I. Natarajan, Neshanic Station, and Eric M. Gordon, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

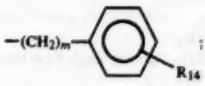
Division of Ser. No. 500,581, Jun. 2, 1983, Pat. No. 4,470,973, which is a continuation-in-part of Ser. No. 399,650, Jul. 19, 1982, abandoned. This application May 29, 1984, Ser. No. 615,014
Int. Cl.³ C07C *125/063, 101/024*
U.S. Cl. 560—27 **4 Claims**

1. A compound of the formula

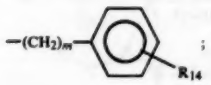


wherein:

R_2 is



R_3 is



R is benzyloxycarbonyl;

m is zero, one, or two; and

R_{14} is hydrogen, methyl, methoxy, methylthio, chloro, bromo, fluoro, or hydroxy.

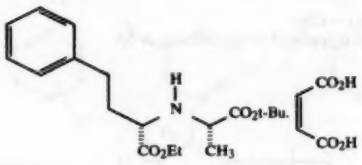
4,535,177

N-SUBSTITUTED AMINO ACID DERIVATIVES

Frederick A. Golec, Jr., Ossining, and Thomas Goetzen, Tuckahoe, both of N.Y., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

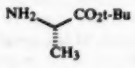
Filed Nov. 14, 1983, Ser. No. 551,448
Int. Cl.³ C07C *101/20*
U.S. Cl. 560—38 **16 Claims**

1. A process of preparing the compound of the formula



comprising the steps of:

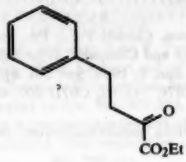
a., dissolving the compound of the formula



in a reaction medium to form a solution;

b., adjusting the pH of the solution to about 4.0 to 5.0;

c., adding with mixing the compound of the formula



to the solution to form a mixture;

d., adding a hydrogenation catalyst to form a reaction mixture;

e., hydrogenating the reaction mixture;

f., removing the catalyst;

g., isolating a crude product;

h., reacting the crude product with maleic acid to form the desired compound.

4,535,178

PROCESS FOR THE PREPARATION OF POLYETHER-ESTER POLYOLS

Curtis J. Reichel, Wyandotte, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sep. 29, 1982, Ser. No. 426,306

Int. Cl.³ C07C *67/08*

U.S. Cl. 560—91 **6 Claims**

1. In a process for the preparation of polyether-ester polyols by the reaction of a polyether polyol and tetrahydrophthalic anhydride to form a half acid ester followed by the reaction of the half acid ester with an alkylene oxide to obtain a product having an acid number of less than about 5 mg KOH/gm the improvement which comprises conducting the reaction between the polyether polyol and the anhydride and the following reaction with the alkylene oxide in the presence of an effective amount of a catalyst selected from the group consisting of calcium naphthenate and cobalt naphthenate.

4,535,179

SYNTHESIS OF BICYCLIC AND TRICYCLIC 7-OXA PROSTAGLANDIN ENDOPEROXIDE ANALOGS VIA OXYPALLADATION OF NORBORNADIENE

Richard C. Larock, Ames, Iowa, assignor to Iowa State University Research Foundation Inc., Ames, Iowa

Filed Mar. 3, 1983, Ser. No. 471,760

Int. Cl.³ C07C *177/00*

U.S. Cl. 560—117 **7 Claims**

1. A method of synthesis of 7-oxa bicyclic prostaglandin analogs, comprising,

reacting norbornadiene palladium dichloride with t-butyl 6-hydroxyhexanoate in an oxypalladation reaction to provide an oxypalladium bicyclic intermediate;

carbonylating said intermediate, in the presence of an organic trialkylamine selected from the group consisting of triethylamine and diisopropylethylamine to provide a bicyclic ester intermediate which in part has the basic prostaglandin analogue carbon skeletal structure; and thereafter

selectively hydrolyzing said ester to an acid,

reducing said acid to an aldehyde,

olefinating said aldehyde by reaction with 2-oxoheptyl phosphonate to provide a keto compound containing the complete carbon skeletal structure of a 7-oxa prostaglandin analog.

4,535,180

11-DEOXY-11-SUBSTITUTED PROSTAGLANDINS OF THE E AND F SERIES

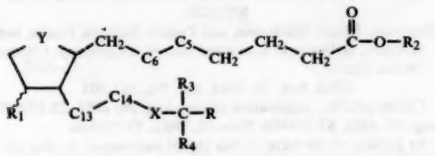
Charles V. Grudzinskas, Garnerville, N.Y., and Martin J. Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 77,707, Sep. 21, 1979, abandoned, which is a division of Ser. No. 776,444, Mar. 10, 1977, Pat. No. 4,241,221, which is a continuation of Ser. No. 552,403, Feb. 24, 1977, Pat. No. 4,057,571, which is a continuation-in-part of Ser. No. 274,559, Jul. 24, 1972, Pat. No. 4,141,914. This application Jul. 30, 1981, Ser. No. 288,396

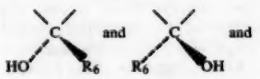
Int. Cl.³ C07C *177/00*

U.S. Cl. 560—121 **15 Claims**

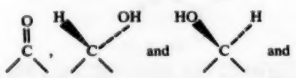
1. A compound selected from the group consisting of an optically active compound of the formula:



and a racemic compound of that formula and the mirror image thereof wherein R is selected from the group consisting of an alkyl group having from 3 to 7 carbon atoms; R_1 is CH_3 or C_2 to C_4 1-alkenyl; R_2 is selected from the group consisting of hydrogen and an alkyl group having from 1 to 12 carbon atoms; R_3 is selected from the group consisting of hydrogen, fluorine and lower alkyl, with the proviso that R_3 is fluorine only if R_4 is fluorine; R_4 is selected from the group consisting of fluorine and lower alkyl with the proviso that R_4 is fluorine only if R_3 is fluorine or hydrogen; X is a divalent moiety selected from the group of those of the formulae:



wherein R_6 is selected from the group consisting of hydrogen and lower alkyl; Y is a divalent moiety selected from the group consisting of those of the formulae:



the moiety $-C_5-C_6-$ is ethylene or cis vinylene and the moiety $-C_{13}-C_{14}-$ is ethylene or trans-vinylene; with the proviso that when $-C_5-C_6-$ is cis-vinylene then $-C_{13}-C_{14}$ be trans-vinylene; and the non-toxic cationic salts thereof when R_2 is hydrogen.

4,535,181

N-CARBOALKOXYMETHYL-N-HALOMETHYL AMIDES

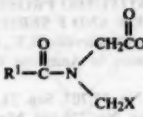
Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 468,223, Feb. 22, 1983, Pat. No. 4,482,504, which is a continuation-in-part of Ser. No. 412,624, Aug. 30, 1982, Pat. No. 4,425,284. This application May 14, 1984, Ser. No. 609,921

Int. Cl.³ C07C *103/48*

U.S. Cl. 560—172 **3 Claims**

1. A compound of the formula



wherein R and R^1 are C_1-C_4 alkyl and X is chlorine, bromine or iodine.

4,535,182

PROCESS FOR PREPARING 2-CYCLOPENTENONE ESTERS

Masayoshi Minai, Moriyama, and Tadashi Katsura, Osaka, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 16, 1983, Ser. No. 523,602

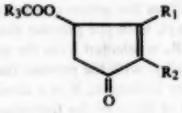
Claims priority, application Japan, Aug. 26, 1982, 57-148609; Aug. 27, 1982, 57-149450; Nov. 12, 1982, 57-199588

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.³ C07C *69/02*

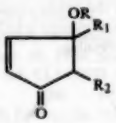
U.S. Cl. 560—231 **9 Claims**

1. A process for preparing 2-cyclopentenone esters of the formula:



(I)

wherein R^1 is hydrogen, lower alkyl or lower alkenyl, R^2 is lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, cycloalkenyl or substituted or unsubstituted aryl and R^3 is hydrogen or lower alkyl, which comprises reacting a racemic or optically active 4-cyclopentenone of the formula:



(II)

wherein R^1 and R^2 are each defined above and R is hydrogen or acyl with at least one lower aliphatic carboxylic acid and/or a metal or amine salt thereof.

4,535,183

PHARMACEUTICAL COMPOUNDS, PREPARATION, USE AND INTERMEDIATES THEREFOR AND THEIR PREPARATION

Geoffrey Kneen, Bromley, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Dec. 18, 1981, Ser. No. 332,246

Claims priority, application United Kingdom, Dec. 18, 1980, 8040512

Int. Cl.³ C07C *65/40*

U.S. Cl. 514—568 **21 Claims**

1. 4-(2-Formyl-3-hydroxyphenoxymethyl)benzoic acid and salts thereof.

4,535,184

TRIS(DISUBSTITUTED AMINO)SULFONIUM PERFLUOROCARBANION SALTS

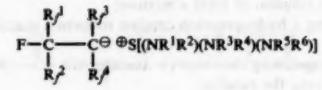
William J. Middleton, Chadds Ford, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jun. 8, 1984, Ser. No. 618,737

Int. Cl.³ C07C *145/02*; C07D *207/48, 211/96*

U.S. Cl. 564—102 **5 Claims**

1. Tris(disubstituted amino)sulfonium perfluorocarbanion salt of the formula



wherein

R^1 through R^6, each selected independently, are C_1-C_{20} alkyl, each having at least 2 alpha hydrogen atoms, or any or all of the pairs R^1 and R^2, R^3 and R^4, and R^5 and R^6, each pair selected independently, are $—(CH_2)_4$ or $—(CH_2)_2CHY—(CH_2)_2$, wherein Y is hydrogen or methyl;

R_f^1, R_f^2 and R_f^3, each selected independently, are F, C_{1-20} perfluoroalkyl or C_{4-12} perfluorocycloalkyl; and

R_f^4 is C_{1-20} perfluoroalkyl or C_{4-12} perfluorocycloalkyl; or

any one of the pairs R_f^1 and R_f^2, R_f^3 and R_f^4, R_f^1 and R_f^3, and R_f^2 and R_f^4, taken together, is $—(CF_2)_n$ wherein n is an integer and is 2 to 6; or

each of the pairs R_f^1 and R_f^2 and R_f^3 and R_f^4, or each of the pairs R_f^1 and R_f^3 and R_f^2 and R_f^4, taken together, is $—(CF_2)_n$ wherein n, each selected independently, is an integer and is 2 to 6.

4,535,185

PROCESS FOR THE PRODUCTION OF GUANIDINE NITRATE FROM A MIXTURE OF UREA AND AMMONIUM NITRATE

Matthias Thoma, Waldkraiburg, Fed. Rep. of Germany, assignor to Industrie Chemie Thoma GmbH & Co Produktions KG, Waldkraiburg, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,713

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 3236221

Int. Cl.³ C07C *128/00*; B01J *37/00*

U.S. Cl. 564—242 **7 Claims**

1. In a process for the production of guanidine nitrate of the type wherein a mixture of urea and ammonium nitrate are reacted in the presence of an SiO_2 catalyst, at an elevated temperature, and in the presence of an excess of ammonium nitrate, followed by recovery of the guanidine nitrate, the improvement comprising:

removing the catalyst from the reaction mixture by filtration;

slurrying the catalyst with a melt of a material selected from the group consisting of ammonium nitrate, and a mixture of ammonium nitrate and urea at a temperature of from 135° C. to 200° C. to thereby regenerate the catalyst; and

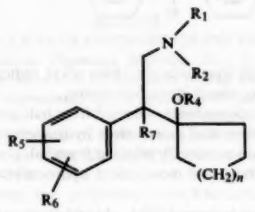
recovering the regenerated catalyst from the slurry by filtration.

4,535,186
2-PHENYL-2-(1-HYDROXYCYCLOALKYL OR 1-HYDROXYCYCLOALK-2-ENYL)ETHYLAMINE DERIVATIVES

G. E. Morris Husbands, Berwyn; John P. Yardley, Gulph Mills, and Eric A. Muth, West Chester, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 486,594, Apr. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 449,032, Dec. 13, 1982, abandoned. This application Oct. 26, 1983, Ser. No. 545,701
Int. Cl.³ C07C *87/28*
U.S. Cl. 564—336 32 Claims

1. A compound of the formula:



wherein
the dotted line represents optional olefinic unsaturation, and
R_1 is hydrogen or alkyl of 1 to 6 carbon atoms;
R_2 is alkyl of 1 to 6 carbon atoms;
R_4 is hydrogen, alkyl of 1 to 6 carbon atoms, formyl, or alkanoyl of 2 to 7 carbon atoms;
R_5 and R_6 are independently hydrogen, hydroxyl, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkanoyloxy of 2 to 7 carbon atoms, nitro, alkylmercapto of 1 to 6 carbon atoms, amino, alkylamino of 1 to 6 carbon atoms, dialkylamino in which each alkyl group is of 1 to 6 carbon atoms, alkanamido of 2 to 7 carbon atoms, halo, or trifluoromethyl;
R_7 is hydrogen or alkyl of 1 to 6 carbon atoms; and
n is one of the integers 0, 1, 2, 3 or 4;
or a pharmaceutically acceptable salt thereof.

4,535,187
PREPARATION OF ISOPHORONE AND MESITYL OXIDE FROM ACETONE

Anthony J. Papa, St. Albans, and Steven W. Kaiser, South Charleston, both of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

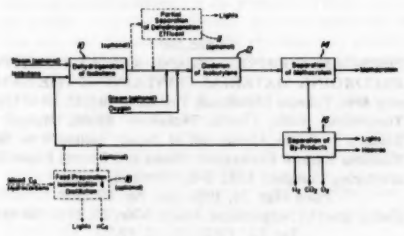
Filed Dec. 21, 1983, Ser. No. 564,023
Int. Cl.³ C07C *45/45*
U.S. Cl. 568—353 5 Claims

1. Method of converting acetone to isophorone and mesityl oxide which comprises contacting acetone vapor at a temperature of about 275° C. to about 350° C. and at a flow rate of about one volume of feed per volume of catalyst per hour with a heterogeneous catalyst prepared by
(a) Introducing onto an alumina support a sufficient amount of an inorganic or organic calcium salt to provide a loading of from about 1 to 20 weight percent of calcium in the final catalyst whereby said alumina has a surface area in excess of about 30 meters²/gram and an average pore volume in excess of about 0.40 cc/gram and
(b) calcining the alumina supported calcium salt from step (a) at a temperature of about 300° to about 600° C. for at least about 3 hours; and recovering a product of unreacted acetone. isophorone and mesityl oxide.

4,535,188
CONVERSION OF ISOBUTANE TO METHACROLEIN

Sargis Khoobiar, Kinnelon, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 368,196, Apr. 14, 1982, Pat. No. 4,413,147. This application Sep. 20, 1982, Ser. No. 420,077
The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.
Int. Cl.³ C07C *45/35*
U.S. Cl. 568—479 15 Claims



1. A process for the preparation of methacrolein from isobutane in the presence of other C_4 hydrocarbons comprising:
(a) dehydrogenating a C_4 hydrocarbon feed stream comprising isobutane as a major fraction thereof in the presence of steam over a dehydrogenation catalyst comprising a Group VIII noble metal on a support at a temperature in the range of about 300°–700° C. and up to about 10 kg/cm² gauge pressure to form an effluent stream comprising isobutylene, hydrogen, carbon oxides, normal butenes, steam, and unreacted C_4 hydrocarbons;
(b) mixing oxygen and optionally steam with said effluent stream of (a) and passing the mixture over a molybdenum-based catalyst at conditions selected to produce methacrolein and producing an effluent stream comprising methacrolein, unreacted isobutylene and isobutane, butadiene, oxygen, hydrogen, steam, and carbon oxides;
(c) recovering the methacrolein from said effluent of (b);
(d) separating from said effluent of (b) after recovery of methacrolein therefrom the hydrogen produced in (a), the carbon oxides produced in (a) and (b), and the unreacted oxygen of (b); and
(e) returning as feed to (a) the effluent of (b) after recovering methacrolein, hydrogen, oxygen, and carbon oxides therefrom.

4,535,189
POLYOL PURIFICATION PROCESS

Michael Cuscurida, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 21, 1984, Ser. No. 591,703
Int. Cl.³ C07C *41/03*
U.S. Cl. 568—620 8 Claims

1. In a method wherein a C_2–C_4 alkylene oxide is reacted with an initiator to form an alkylene oxide polymer under alkaline conditions in the presence of a hydroxide, hydride or alkoxide of sodium or potassium and wherein the alkylene oxide polymer is thereafter neutralized with an acid component comprising sulfuric acid, phosphoric acid, acetic acid or oxalic acid and then passed through a filter to obtain a final alkylene oxide polymer product, the improvement which comprises:
(a) recovering filter cake resulting from the filtration step;
(b) mixing said filter cake with a treating agent comprising a lower aliphatic alcohol containing from about 1 to 4 carbon atoms and also containing from 0 up to about 40 wt. % of water;
(c) filtering said mixture; and

(d) recovering additional alkylene oxide polymer from said filtrate from said second filtration step.

4,535,190

PHENOLIC COMPOUNDS AND A HEAT-SENSITIVE RECORDING MATERIAL CONTAINING THE SAME

Naoto Arai; Takeshi Murakami; Toshitake Suzuki, all of Hyogo; Toranosuke Saito, Osaka; Masakatu Kitani, Hyogo, and Takashi Ishibashi, Osaka, all of Japan, assignors to Sanko Kaihatsu Kagaku Kenkyusho, Osaka and Kanzai Paper Manufacturing Company Ltd., Tokyo both of, Japan

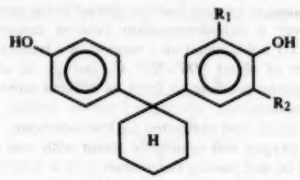
Filed Mar. 23, 1984, Ser. No. 592,598

Claims priority, application Japan, Mar. 25, 1983, 58-48939

Int. Cl.³ C07C *39/17, 39/12*

U.S. Cl. 568—721 **2 Claims**

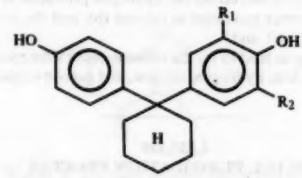
1. Novel phenolic compounds expressed by the general formula I



I

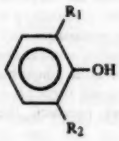
wherein R_1 represents an alkyl group or a cycloalkyl group and R_2 represents hydrogen atom or an alkyl group.

2. A process for producing phenolic compounds expressed by the general formula I



I

wherein R_1 represents an alkyl group or a cycloalkyl group and R_2 represents hydrogen atom or an alkyl group, which process comprises reacting p-cyclohexenylphenol with an o-substituted phenol expressed by the general formula



wherein R_1 and R_2 are as defined above, in the presence of an acidic catalyst selected from the group consisting of metal halides, sulfuric acid, phosphoric acid, sulfonic acid, activated clay and ion exchange resins, at temperatures of from 30° to 130° C.

4,535,191

DIHYDRIC PHENOLS

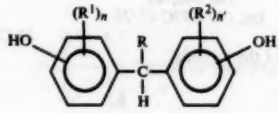
Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Feb. 23, 1984, Ser. No. 582,946

Int. Cl.³ C07C *39/16, 39/24*

U.S. Cl. 568—727 **13 Claims**

1. Dihydric phenols represented by the general formula



wherein:

R is selected from straight chain alkyl radicals containing from 11 to about 30 carbon atoms;

each R^1 is independently selected from halogen, monovalent hydrocarbon, and monovalent hydrocarbonoxy radicals;

each R^2 is independently selected from halogen, monovalent hydrocarbon, and monovalent hydrocarbonoxy radicals; and

n and n' are independently selected from whole numbers having a value of from 0 to 4 inclusive.

4,535,192

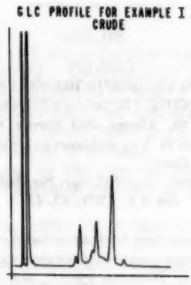
TERTIARY PENTAMETHYLINDANOL DERIVATIVES AND ORGANOLEPTIC USES THEREOF

John B. Hall, Rumson, and Takao Yoshida, West Long Branch, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

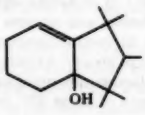
Division of Ser. No. 589,662, Mar. 14, 1984,. This application Nov. 14, 1984, Ser. No. 671,330

Int. Cl.³ C07C *35/23*

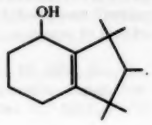
U.S. Cl. 568—819 **2 Claims**



1. The compound having the structure:



in the absence of the compound having the structure:



4,535,193

1,4,6,9-TETRANITRODIAMANTANE

Gilbert P. Sollott, Plymouth Meeting, Pa., and Everett E. Gilbert, Morristown, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 5, 1984, Ser. No. 586,364
Int. Cl.³ C07C *79/08*
U.S. Cl. 568—941 **7 Claims**

2. A process for preparing 1,4,6,9-tetranitrodiamantane which comprises reacting 1,4,6,9-tetraminodiamantane tetrahydrochloride with an oxidizing agent.

4,535,194

PROCESS FOR PRODUCING 1,1,2,3-TETRACHLOROPROPENE

Scott S. Woodard, Maryland Heights, Mo., assignor to Monsanto Co., St. Louis, Mo.

Filed Jul. 6, 1983, Ser. No. 511,131
Int. Cl.³ C07C *17/00*
U.S. Cl. 570—236 **6 Claims**

1. A process for producing 1,1,2,3-tetrachloropropene comprising the steps of:

preparing 1,1,1,3-tetrachloropropane by reacting ethylene with carbon tetrachloride in the presence of both a source of metallic iron that is effective as an activator for the reaction, and a promoter for the reaction, said promoter being selected from phosphorus (V) compounds containing a phosphoryl group;

dehydorchlorinating said 1,1,1,3-tetrachloropropane to produce a mixture of 1,1,3- and 3,3,3-trichloropropenes;

chlorinating at least one of the trichloropropenes obtained by said dehydrochlorination of 1,1,1,3-tetrachloropropane to produce 1,1,1,2,3-pentachloropropane;

dehydrochlorinating the 1,1,1,2,3-pentachloropropane to produce a mixture of 1,1,2,3- and 2,3,3,3-tetrachloropropenes; and

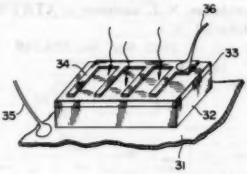
contacting the mixture of tetrachloropropenes with a rearrangement catalyst, thereby converting the 2,3,3,3-tetrachloropropene content thereof to 1,1,2,3-tetrachloropropene.

4,535,195

PHOTOELECTROMOTIVE FORCE ELEMENT

Kiyoshi Morimoto, Mobara, and Toshinori Takagi, Nagaoka-kyo, both of Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Jan. 18, 1984, Ser. No. 571,692
Claims priority, application Japan, Jan. 19, 1983, 58-5883
Int. Cl.³ H01L *31/06*
U.S. Cl. 136—261 **3 Claims**



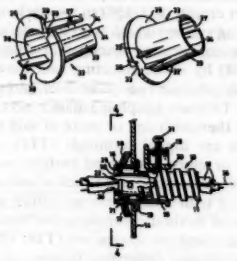
1. A photoelectromotive force element comprising one conductivity type semiconductor substrate and the other conductivity type iron oxide film consisting essentially of FeOx ($1 \leqq X \leqq 2$) deposited on said semiconductor substrate.

4,535,196

ELECTRICAL ANTI-SHORT BUSHING

John D. Milne, 77 Bywood Dr., Islington, Ontario, Canada M9A 1M2

Filed Nov. 4, 1982, Ser. No. 439,109
Int. Cl.³ H02G *15/06*
U.S. Cl. 174—83 **11 Claims**



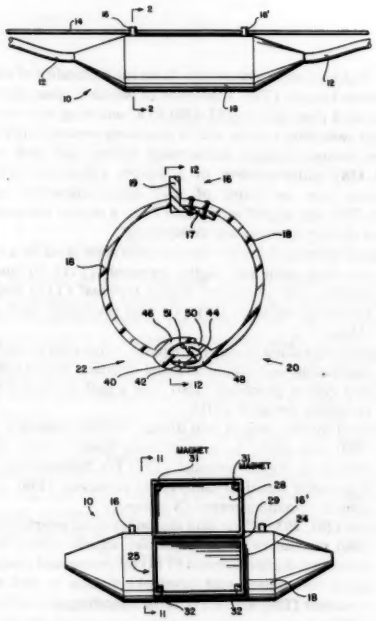
11. An electrical anti-short bushing mounted on an electrical cable which has a longitudinal axis and which comprises an outer casing in the form of a helically wound metallic cladding strip adjacent coils of which are interlocked, and electrically insulated conductor wiring extending through and projecting from an end of the outer casing, said end of the outer casing comprising a cut through the metallic cladding strip with the cut extending substantially parallel to the longitudinal axis of the cable and having an inwardly projecting portion of sharp form, the bushing comprising a tubular portion having a longitudinal axis and having a first end and a second end, and an outwardly extending flange portion presented by said first end of the tubular portion, the tubular portion being disposed between the outer casing of the electrical cable and the insulated conductor wiring which extends therethrough, the bushing having a discontinuity extending throughout its axial length, and two outwardly projecting, circumferentially spaced ribs extending axially along at least a portion of the tubular portion of the bushing with a part of the tubular portion being between the ribs and with said cut through the metallic cladding strip of the outer casing being positioned between the ribs whereby inadvertent turning of the bushing in either direction relative to the cable to dispose the discontinuity of the bushing in alignment with said inwardly projecting sharp portion of said cut through the metallic cladding strip is substantially prevented by interengagement of a respective one of the outwardly projecting ribs of the bushing with said inwardly projecting portion of said cut through the metallic cladding strip.

4,535,197

UNITARY CABLE CLOSURE

David O. Butler, 1306 Vermont Ave., Tarpon Springs, Fla. 33589

Filed Apr. 6, 1984, Ser. No. 597,673
Int. Cl.³ H02G *15/113, 15/18, 7/08*
U.S. Cl. 174—41 **28 Claims**



1. A unitary cable closure for enclosing a communications cable suspended from a support strand, comprising:

a hollow, flexible wall, tubular housing having a pair of longitudinal mating edges separated by a longitudinal access slot, said edges being manually fastenable together in mating engagement after passing a cable through said slot;

a circumferential rib portion integrally formed in said wall of said tubular housing;

a metal hanger bracket having a lower, substantially horizontal portion fastened to the inside upper surface of said tubular housing at said rib portion and a vertical portion projecting upwardly through said upper surface of said rib portion of said tubular housing, for fastening to a support strand;

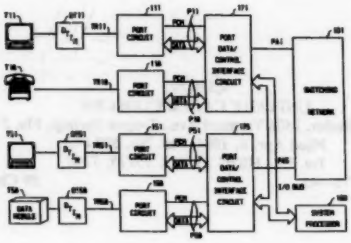
whereby said closure can be manually fastened about a cable.

4,535,198

DIGITAL TERMINAL KEYBOARD DIALING

Gaetano N. Squicciarini, Freehold Township, Monmouth County, N.J., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Jul. 18, 1983, Ser. No. 514,882
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 DP **8 Claims**



1. In a switching system which serves a plurality of communications circuits (T11–T58), each of which is connected by an associated port circuit (111–158) to a switching network (101) of said switching system, which switching network (101) establishes communications connections among said port circuits (111–158) under control of a system processor (100) and wherein one or more of said communications circuits (T11–T58) are digital terminals (T11), a digital terminal keyboard dialing arrangement comprising:

digital terminal interface means (200) associated on a one-to-one basis with said digital terminals (T11) for interconnecting said associated digital terminal (T11) with said switching network (101) via said associated port circuit (111);

control signalling means (S channel) connected to and interconnecting said digital terminal interface means (200) and said system processor (100) over a path exclusive of said switching network (101);

control means (205) in said digital terminal interface means (200) responsive to a predefined signal output by said associated digital terminal (T11) for transmitting a call origination signal to said system processor (100) via said control signalling means (S channel);

means (201, 203–205) in said digital terminal interface means (200) responsive to all keystroke signals output by said associated digital terminal (T11) following said predefined signal for routing said keystroke signals to said system processor (100) via said control signalling means (S channel); and

means in said system processor (100) responsive to said keystroke signals representing a called party identifier for activating said switching network (101) to establish a network connection between the port circuits associated with said digital terminal (T11) and said called party.

7. In a switching system which serves a plurality of communications circuits (T11–T58), each of which is connected by an associated port circuit (111–158) to a switching network (101) of said switching system, which switching network (101) establishes network connections among said port circuits (111-158) under control of a system processor (100), a call origination method comprising the steps of:

monitoring said communications circuits (T11–T58) for a signal (BREAK) indicative of a call origination at any one of said communications circuits (T11);

transmitting ASCII keystroke signals representing the identification of a called communication circuit from said call originating communication circuit (T11) to said system processor (100) over a signalling path exclusive of said switching network; and

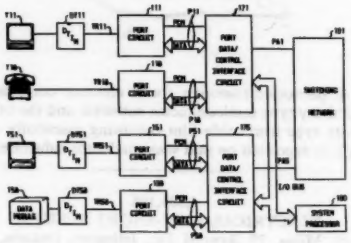
activating said switching network (101) in response to the reception of said ASCII keystroke signals to establish a network connection between said call originating communication circuit (T11) and said called communication circuit (T58).

4,535,199

DATA CALL TRANSFER PREINDICATION

John H. Zink, Manalapan, N.J., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Jul. 18, 1983, Ser. No. 514,518
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 DP **7 Claims**



1. In a switching system which serves a plurality of communications circuits (T11–T58) each of which is connected by an associated port circuit (111–158) to a switching network (101) of said switching system, which switching network (101) establishes network connections among said communications circuits (T11–T58) by interconnecting said associated port circuits (111–158), wherein one or more of said communications circuits (T18, T51) are telephone station sets, each of which has associated therewith one or more of said communications circuits which are digital terminals (T11), said association including one or more designated buttons on said telephone station set (T18) corresponding to each of said digital terminals (T11) associated with said telephone station set (T18), a data call preindication method comprising the step of:

scanning said telephone station sets (T18, T51) for an operation of one of said designated buttons on any one of said telephone station sets (T18) in response to the initiation of a call at said telephone station set (T18); and

reserving in response to the operation of one of said designated buttons on said telephone station set (T18), the one of said digital terminals (T11) associated with said operated designated button.

4,535,200

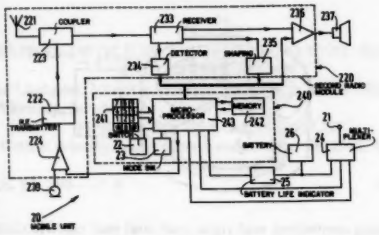
CORDLESS TELEPHONE SYSTEM WITH SECURITY CODING

Alain J. Himmelbauer, Lognes, and Régis J. P. Poubelle, Gretz, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,224
Claims priority, application France, Jan. 24, 1983, 83 01036
Int. Cl.³ H04Q *7/04*; H04M *1/66*
U.S. Cl. 179—2 EA **4 Claims**

1. An arrangement for telephone communication by means of a radio-electric link, said link being formed by a base unit and a mobile unit which constitute the fixed part of the arrangement and its optionally movable part, respectively, said base unit comprises an interface module for the connection to the telephone network, a first radio-electric module for transmitting to the mobile unit signals coming from the telephone

network and for receiving and conveying to this network signals coming from the mobile unit, and a first processing module formed by a first microprocessor and a first memory, said mobile unit comprises a second radio-electric module for transmitting speech signals to the base unit and for receiving signals coming from the telephone network via the base unit, and a second processing module formed by a programming keyboard, a second microprocessor and a second memory, said



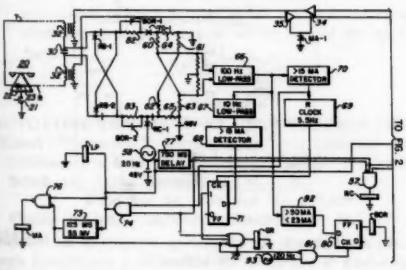
base and mobile units each comprise a multiplexer and also a contact for interconnecting them during a pre-operational, start-up procedure wherein storage in said memories by the user of a personal, characteristic code is accomplished, said code being input via said programming keyboard of said mobile unit and stored simultaneously in the memories of the base and the mobile units, this personal code assuring that only communications between said mobile unit and said base unit are enabled.

4,535,201

GROUND START DETECTION IN TELEPHONE LOOP SIGNALLING CIRCUIT

Puran S. Kasbia, Kanata, and Yuan-Lu Li, Toronto, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Apr. 16, 1984, Ser. No. 600,789
Int. Cl.[3] H04M *3/22, 7/14*
U.S. Cl. 179—18 FA **3 Claims**



1. A loop signalling circuit capable of operating in the presence of spurious signals, for replicating signalling functions on a telephone line when serially connected between a central office and a remote terminal operating in either a loop start or a ground start configuration, comprising:

low-pass filter means for passing signals from the remote terminal below the frequency of said spurious signals;

first detector means for detecting when the line current on the remote terminal side of the telephone line exceeds a preselected value;

second detector means for detecting signals from the low-pass filter means when the line current exceeds the preselected value;

a clock generator which is synchronized on each occurrence that the first detector means detects current in the line that exceeds said preselected value;

latch means set to the output state of the second detector means on each occurrence of a pulse signal from the clock generator; and

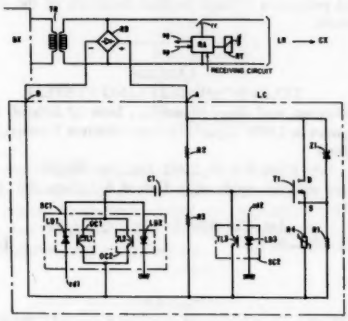
control means responsive to the latch means for applying a ground start impedance on the central office side of the telephone line.

4,535,202

LOOP-CIRCUIT FOR TELEPHONE LINE

Bernard Meunier, Le Chesnay, France, assignor to Compagnie Generale de Constructions Telephoniques, Paris, France

Filed Jun. 30, 1983, Ser. No. 509,789
Claims priority, application France, Jul. 7, 1982, 82 11898
Int. Cl.[3] H03K *17/00;* H04M *1/31*
U.S. Cl. 179—18 FA **4 Claims**



1. A loop-circuit for a telephone line comprising a gyrator circuit consisting of a transistor of which a first electrode is directly connected to one of the wires of the line, of which a second electrode is connected to the other of the wires of the line via a resistor, of which the gate electrode is connected via a resistor to said one of the wires of the line, and via a capacitor to said other wire of the line, characterized in that a switch (SC2) directly connected between the gate electrode of said transistor (T1) and said other wire of the line is arranged responsive to a signal cutting off said transistor (T1), and that another switch (SC1) directly connected between said capacitor (C1) and said other wire of the line is arranged responsive to a signal disconnecting one of the plates of said capacitor (C1) from the rest of the circuit.

4,535,203

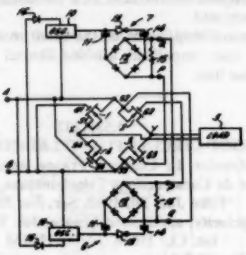
BRIDGE RECTIFIER CIRCUIT

James O. M. Jenkins, and Nigel C. Gardner, both of Swansea, Wales, assignors to Siliconix Limited, United Kingdom

Filed Dec. 7, 1983, Ser. No. 558,830
Claims priority, application United Kingdom, Dec. 8, 1982, 8235044
Int. Cl.[3] H03K *5/22*
U.S. Cl. 179—81 R **14 Claims**

1. A bridge rectifier circuit comprising a bridge of switching transistors having their control terminals connected to switch the transistors to provide either full wave rectification of an AC input voltage or polarity correction of a DC input voltage of either polarity, the switching transistors being all of the same polarity type, at least two floating drivers connected to generate and supply control potentials to the control terminals respectively of a pair of the switching transistors, said floating drivers comprising a source of voltage pulses, means controlling said source to produce voltage pulses only when the input voltage has a predetermined polarity, a respective bridge rectifier for each said driver, and capacitor means linking each said

respective bridge rectifier to the said sorce of voltage pulses, and the rectified outputs of said bridge rectifiers providing said



control potentials to said control terminals of the switching transistors.

4,535,204

TELEPHONE DIALLING SYSTEM

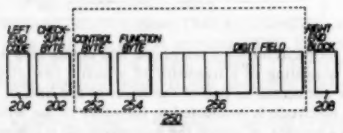
John Hughes, and John Mouncher, both of Bristol, England, assignors to LHW Telephone Auto Diallers Limited, London, England

Filed Jul. 16, 1982, Ser. No. 398,803

Claims priority, application United Kingdom, Jul. 17, 1981, 8122132

Int. Cl.³ H04M *1/26, 1/30, 1/36*

U.S. Cl. 179—90 BD **12 Claims**



1. Apparatus for dialling telephone numbers, comprising:

means for inputting telephone numbers as a sequence of signals,

a microprocessor and an associated digital memory connected to said inputting means for processing and storing numbers represented by signals entered by said inputting means,

means connectable to a telephone line for outputting telephone numbers thereto as signals in a predetermined format, said output means being connected to said microprocessor to receive signals representing a stored number,

means storing routines for controlling the operation of the microprocessor, and

means for applying a signal to said microprocessor whereby the latter is controlled to detect whether a number stored in said digital memory has a predetermined characteristic and upon detection of such characteristic to inhibit the sending of the stored number signals to said output means.

4,535,205

ELECTROACOUSTIC TRANSDUCER OF THE PIEZOELECTRIC POLYMER TYPE

Pierre Ravinet; Christian Claudepierre; Denis Guillou, and Francois Micheron, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 9, 1982, Ser. No. 406,517

Claims priority, application France, Aug. 11, 1981, 81 15506

Int. Cl.³ H04R *17/00*

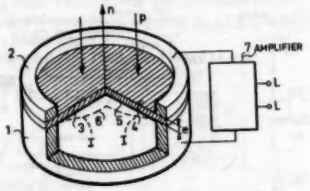
U.S. Cl. 179—110 A **14 Claims**

1. An electroacoustic transducer of the piezoelectric polymer type comprising:

a vibrating element including at least one elastic structure made from a piezoelectric polymer in the form of a rigid plate, said rigid plate being subjected directly to acoustic pressure on at least one of its faces;

at least two electrodes forming a capacitor and one of said at least two electrodes being disposed on each face of said rigid plate;

an impedance-matching electric circuit connected to said at least two electrodes;



a casing containing said rigid plate and said electric circuit, said casing including a base having a wavy end surface, an annular clamping member having a mating wavy end surface for clamping said rigid plate to said base, and a pair of output terminals, wherein when said at least one face is subjected to acoustic pressure a sag is formed in the middle of said rigid plate and inflection points are formed on either side of said sag.

4,535,206

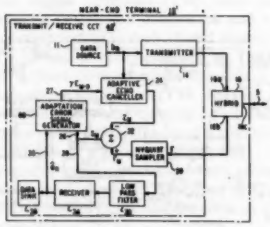
ECHO CANCELLATION IN TWO-WIRE FULL-DUPLEX DATA TRANSMISSION WITH ESTIMATION OF FAR-END DATA COMPONENTS

David D. Falconer, Red Bank, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 138,663, Apr. 9, 1980, abandoned. This application Jun. 8, 1982, Ser. No. 386,224

Int. Cl.³ H04B *3/24*

U.S. Cl. 179—170.2 **25 Claims**



1. An arrangement for processing samples of an incoming signal which is corrupted by echoes of a transmitted signal representing a train of transmitted near-end data symbols, said incoming signal representing a train of transmitted far-end data symbols and said samples having respective far-end data components and echo components, said arrangement comprising

echo cancelling means operative in response to a stream of said transmitted near-end data symbols and a stream of adaptation error signals for generating a replica of each of said echo components, and

signal processing means for producing a stream of echo compensated samples as a function of the difference between each of said samples and the replica of its echo component and for forming decisions as to the values of said transmitted far-end data symbols in response to said echo compensated signals,

and means for generating an individual one of said adapta-

tion error signals as a function of said difference between an individual one of said samples and the replica of its echo component and as a function of an estimate signal, said estimate signal being substantially equal to the far-end data component of said individual one of said samples, said generating means including reference former means for forming said estimate signal as a function of individual ones of said decisions and as a function of at least ones of said stream of adaptation error signals.

4,535,207

SAFETY DEVICE IN AN OPERATING UNIT FOR AN INDUSTRIAL ROBOT

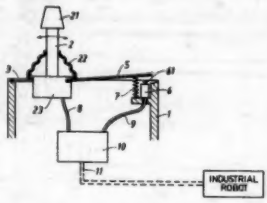
Ake Lindqvist, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Jun. 10, 1983, Ser. No. 503,122

Claims priority, application Sweden, Jun. 24, 1982, 8203945

Int. Cl.³ H01H *9/54*

U.S. Cl. 200—17 R **9 Claims**



1. An operating unit for an industrial robot, said operating unit comprising:

a hand operated joystick for controlling the movement of such a robot when programming it;

transducer means for sensing the presence of the heel of the hand of an operator when the same hand is resting on said transducer means while fingers of the same hand are operating said joystick, said transducer means being positioned so that during operation of said joystick, the heel of the operator's hand rests thereon; and control means operatively associated with said transducer means and said joystick for preventing said joystick from controlling the movement of such a robot when said transducer means does not sense the presence of the heel of the operator's hand.

4,535,208

ACTUATING DEVICE FOR A HIGH-VOLTAGE SWITCH

Hubert Wallimann, Oberentfelden, and Johann Blatter, Schönenwerd, both of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Jan. 16, 1984, Ser. No. 571,098

Claims priority, application Switzerland, Jan. 25, 1983, 410/83

Int. Cl.³ H01H *35/38*

U.S. Cl. 200—82 B **9 Claims**

1. An actuating device for a high-voltage switch, comprising:

an actuating rod movable through two strokes of mutually opposite direction for actuating the high-voltage switch to perform a cut-off stroke and a cut-on stroke;

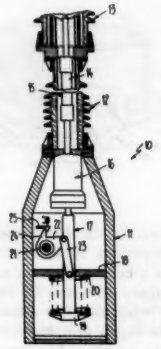
at least one cut-off spring operatively coupled with said actuating rod;

said at least one cut-off spring being loaded and exerting a force on said actuating rod when said cut-on stroke has been performed;

means for variably altering, during said cut-off stroke and said cut-on stroke the force exerted by said cut-off spring upon said actuating rod;

said variably altering means comprising a force transmission mechanism arranged between said cut-off spring and said actuating rod;

said force transmission mechanism possessing a first force-displacement characteristic when said cut-on stroke is performed and a second force-displacement characteristic when said cut-off stroke is performed;



said first force-displacement characteristic differing from said second force-displacement characteristic; and

said second force-displacement characteristic comprising a sudden reduction of the force acting upon said actuating rod during said cut-off stroke.

4,535,209

PRESSURE-SENSITIVE ELECTRICAL SWITCH

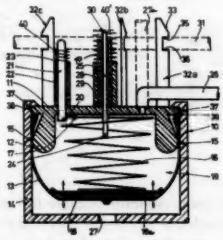
Gerhard Kurz, Industriestrasse, 7262 Althengstett, Fed. Rep. of Germany

Filed Dec. 16, 1983, Ser. No. 562,209

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340436

Int. Cl.³ H01H *35/34*

U.S. Cl. 200—83 R **10 Claims**



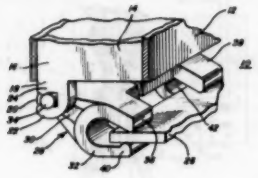
1. A pressure-sensitive switch comprising a housing having a pressure chamber therein, said housing being provided with a base, a diaphragm within said pressure chamber normally in a home position and movable therefrom in response to pressure changes within said chamber, biasing means for biasing said diaphragm to said home position, at least one electrical contact projecting outwardly from said housing base and adapted to be connected to a circuit board, at least one latching element positioned inwardly from the edge of said base and extending outwardly from said housing for mounting said housing on the circuit board, said latching element comprising a depending leg having engaging means at the end thereof for engaging a portion of the circuit board to mount said housing thereon in spaced relation to the board, and electrical connecting means for connecting said contact to the circuit board.

4,535,210

KEYSWITCH STABILIZING DEVICE

Charles Shedore, Elmhurst, and Stanley E. Filipiak, Chicago, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Apr. 18, 1984, Ser. No. 601,418
Int. Cl.³ H01H 3/12
U.S. Cl. 200—340 **5 Claims**



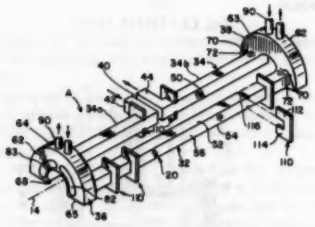
1. An apparatus for stabilizing operational movement of an actuator for a keyswitch mounted to a base, said base having a top surface and a bottom surface, said apparatus comprising one or more unitary, substantially rigid members; said one or more members being movably attached to said actuator at a first end and having a gripping means at a second end for slidingly gripping said base by engaging said top surface and said bottom surface substantially adjacent a free edge of said base, said gripping means slidingly bearing against at least one of said top surface and said bottom surface in response to said operational movement of said actuator.

4,535,211

INDUCTOR AND METHOD OF MAKING SAME

Michael J. Carter, Troy, Mich., assignor to Tocco, Inc., Boaz, Ala.

Filed Oct. 24, 1984, Ser. No. 664,414
Int. Cl.³ H05B 6/42
U.S. Cl. 219—10.49 R **14 Claims**



1. A single loop inductor suitable for inductively heating a generally cylindrical elongated part comprising:

a one piece member, adapted to be positioned coaxial with the part, having a pair of arcuate axially spaced crossover conductors lying in a plane transverse to the axis and integrally interconnected with a pair of linear conductors extending parallel to the axis and mutually radially spaced therefrom;

a first set of drilled passages formed longitudinally in each said linear conductors, said passages having ends extending through said crossover conductors;

slot means formed in the end faces of said cross-over conductors and communicating said ends of said passages;

means establishing an electrical discontinuity in one of said conductors;

lead means electrically connected to said one of said conductors on opposite sides of said electrical discontinuity;

means for sealing said slot means in said end faces of said crossover conductors whereby said slot means and said first set of drilled passages define internal coolant passages in said conductors;

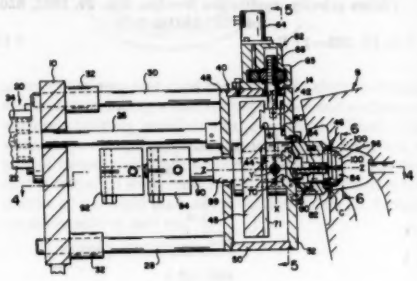
a second set of drilled passages formed at spaced locations of the conductors fluidly communicating with said coolant passages and having exteriorally opening ends adapted to be connected to a coolant supply during said heating for establishing a coolant circuit for cooling said conductors.

4,535,212

APPARATUS AND METHOD OF HARDENING VALVE SEATS

Richard S. Sheetz, Shaker Hts., and John F. Cachat, Rocky River, both of Ohio, assignors to Tocco, Inc., Boaz, Ala.

Filed Jul. 6, 1984, Ser. No. 628,394
Int. Cl.³ H05B 6/06
U.S. Cl. 219—10.77 **9 Claims**



1. An induction heating device for heating the conical surface of a valve seat of an engine component prior to quench hardening, said induction heating device comprising:

inductor means having a conical surface complementary to the conical surface of the valve seat;

means for advancing said inductor means toward said valve seat;

guide means for accommodating movement of the inductor means in a plane wherein the axes of the conical surfaces are parallel;

means coacting between said guide means, the valve seat, and said inductor means for coaxially positioning said conical surfaces;

means for detecting the distance between said inductor means and the valve seat subsequent to the coaxial positioning and during said advancing toward said valve seat, said detecting means including transceiver means reflectively coacting with the conical surface of the valve seat and transmitting a signal related to the distance between said inductor means and said valve seat;

means for receiving said signal and operable for further continuing said advancing of said inductor means toward said valve seat until said conical surfaces are coaxially aligned at a predetermined spaced relationship;

means for energizing said inductor means at said predetermined spaced relationship; and,

means operative after said heating for retracting said inductor coil away from the component.

4,535,213

APPARATUS FOR WELDING IN VERTICAL, HORIZONTAL AND SLANTING POSITION

Srnic Ljubomir, 41000 Zagreb, Vidikovac 18, Yugoslavia

Filed Oct. 20, 1982, Ser. No. 435,509
Int. Cl.³ B23K 11/02
U.S. Cl. 219—57 **6 Claims**

1. A welding apparatus having a hydraulically-actuated, controllable mechanical handling assembly for holding and positioning elements to be joined by welding, a movable and

adjustable support assembly for supporting the handling assembly relative to the elements to be joined, an electric system for providing electric welding current to the handling assembly, and a hydraulic system including a hydraulic drive providing pressurized fluid for the apparatus, control means regulating flow of the pressurized fluid to operate the mechanical handling assembly, and coupling means fluidly interconnecting the hydraulic drive, the handling assembly and the control means, the mechanical handling assembly comprising:

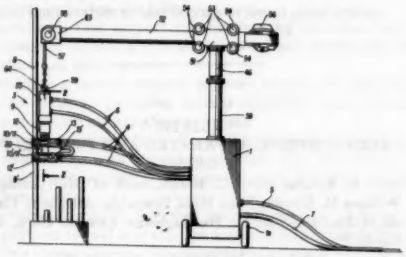
a first mechanical hand having a tubular body portion coupled to a first hydraulic actuator;

a second mechanical hand having an elongated portion slidably disposed within the tubular body portion of the first mechanical hand;

connecting means connecting the elongated portion of the second mechanical hand to the first hydraulic actuator, said actuator operable to reciprocate the second mechanical hand relative to the first mechanical hand;

adjustment means cooperating with the connecting means to adjust the limits of reciprocal movement of the second mechanical hand relative to the first mechanical hand;

each of said first and said second mechanical hands having a first gripping member pivotally movable relative to a second gripping member; and



a second hydraulic actuator associated with the gripping members of each mechanical hand and operable to cause each pair of gripping members to hold the element to be joined by welding;

said support system comprising:

a support post mounted on a movable base;

a tubular housing coaxial with and rotatable relative to the support post;

a hollow holder horizontally fixed to and rotatable with the tubular housing; and

an elongated support member disposed within the hollow holder and adjustably movable relative to the holder, one end of the support member adapted to support the mechanical handling assembly, and the other end having a counterbalancing weight; and

said electric system having a pair of cables, one end of each cable connected to one end of the first and the second mechanical hands, each cable having means for the flow of a fluid therethrough to cool the cable and the mechanical hand;

said control means operable to effect gripping of the elements to be joined by said first and said second mechanical hands and to place the elements in position for welding.

4,535,214

METHOD AND APPARATUS FOR JOINING A TUBE TO A TUBESHEET

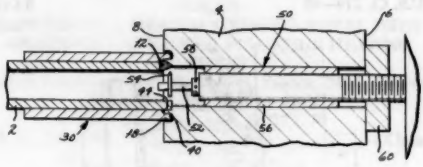
John J. Meyer, St. Louis County, Mo., and Stanley D. Barth, Alton, Ill., assignors to Nooter Corporation, St. Louis, Mo.

Filed Aug. 26, 1983, Ser. No. 526,679

Int. Cl.³ B23K *9/02*

U.S. Cl. 219—60.2 **17 Claims**

1. A process for joining a metal tube to a metal tubesheet having front and back faces, a hole extending through it, and an annular groove opening out of its back face and extending around the hole, said process comprising: positioning the tube in alignment with the hole in the tubesheet when the end of the tube is at the back face of the tubesheet; placing a ring mold



around the tube and inserting the end of the ring mold into the annular groove that opens out of the back face of the tube sheet; and autogenously welding the tube to the tubesheet at the back face of the tubesheet, but not to the ring mold, by applying heat to the end of the tube and the adjacent portion of the tubesheet from within the hole in the tubesheet.

4,535,215

METHOD AND DEVICE FOR CONTROLLING THE WELDING PROCESS IN THE MANUFACTURING OF PIPES WITH LONGITUDINAL SEAMS

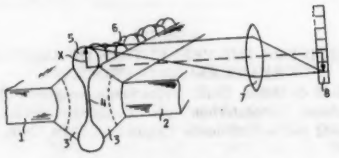
Wilfried Kliesch, Iserlohn; Friedrich-Otto Koch, Unna-Massen; Hans-Jürgen Wahl, Münster; Rolf Krebs, Hamm; Peter Schorr, Münster, all of Fed. Rep. of Germany, and Heinz Strauch, deceased, late of Hagen-Emst, Fed. Rep. of Germany (by Ruth Strauch, Christel Strauch, legal representatives), assignors to Hoesch Werke AG, Dortmund, Fed. Rep. of Germany

Filed Oct. 17, 1983, Ser. No. 542,345

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1982, 3238767

Int. Cl.³ B23K *11/24*

U.S. Cl. 219—61.5 **4 Claims**



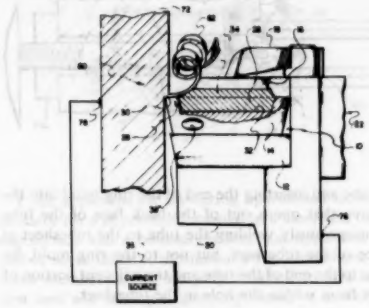
1. Method of controlling an electric welding process in the manufacture of pipes with longitudinal seams comprising the steps of: welding under high frequency a seam along a skelp that is continuously shaped into an open-seamed pipe; applying welding pressure that forces the edges of the skelp together; maintaining welding temperature within ranges at which the seams will weld together properly; controlling welding pressure in accordance with mass of a welding bead; and measuring absolute height of said bead for controlling the welding pressure continously without contacting said bead by sensing light emitted by melted fluid material of the bead, said absolute height of said bead being dependent on the mass of said welding bead and being proportional to the welding pressure.

4,535,216

METAL-WORKING TOOL USING ELECTRICAL HEATING

Michael L. Cassidenti, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 14, 1983, Ser. No. 542,282
Int. Cl.³ B23B *27/10*; B23P *1/02*
U.S. Cl. 219—68 **8 Claims**



1. A metal-working tool held in a metal clamp means, for machining a workpiece so that a chip is sheared from the shear zone thereof, comprising:

a high-strength electrically conductive frame having at least one upper surface having a metal-working region which has a cutting edge thereon;

a core, integral with and within said frame, having an upper extension projecting above said upper surface of said frame, said core being spaced from the workpiece by said frame, said core being formed from an electrically conductive material and said frame and core being formed with an internal fluid passage means having an exit port, said passage and port being located proximate said cutting edge; and

means for connecting said tool to one terminal of a source of electical current and said workpiece to the other terminal of said source,

whereby, when the tool is shearing a chip from said workpiece and wherein the chip has not been broken at the shear zone, the chip comes in contact with the core extension, so that electric current can flow, not only through the frame and cutting edge to the shear zone of the workpiece, but especially through the core and chip to the shear zone.

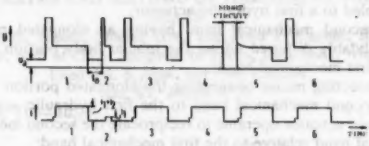
4,535,217

METHOD FOR THE PREVENTION OF ARCING IN A SPARK EROSION PROCESS

Hendrik E. de Bruyn, Delft, Netherlands, assignor to Stichting Steunfonds Laboratorium voor Werkplaatstechniek en Organisatie van de Technische Hogeschool Delft, Delft, Netherlands

Filed Jul. 21, 1983, Ser. No. 516,144
Claims priority, application Netherlands, Jul. 22, 1982, 8202964
Int. Cl.³ B23P *1/08*
U.S. Cl. 219—69 M **6 Claims**

1. A method for the prevention of arcing in a spark erosion process, in which a pulse-shaped voltage is applied between an electrode and an electrically conducting workpiece, which voltage has a first, predetermined amplitude during a variable ignition retarding period determined by the process parameters, and on the termination of said ignition retarding period a discharge takes place between the electrode and the workpiece, resulting in the flow of a pulse-shaped current and in the voltage dropping to a second amplitude determined by the process, characterized by determining during each pulse interval whether a short circuit between the electrode and workpiece has occurred and, upon the detection of such a short circuit, permitting the next successive voltage pulse to be generated without being suppressed or terminated irrespective of the duration of the ignition retarding period exhibited by said pulse, sensing the ignition retarding period and terminating the voltage in response to the absence of a short circuit if the retarding period is less than a predetermined value; and



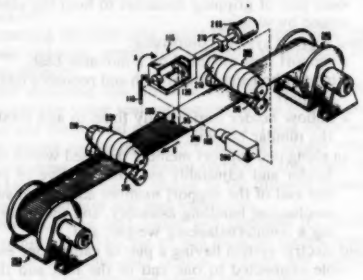
characterized further in that on the termination of the ignition retarding period a first current of relatively low amplitude will flow for a first, relatively short period of time and that a second current of an amplitude a selected amount greater than that of said first current will be added to said first current in response to the ignition retarding period being found to exceed said predetermined duration.

4,535,218

LASER SCRIBING APPARATUS AND PROCESS FOR USING

Robert F. Krause; Gary C. Rauch, both of Murrysville, and William H. Kasner, Penn Hills Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 20, 1982, Ser. No. 435,444
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LH **27 Claims**



1. A machine comprising:

a rotatable means for deflecting a laser beam;

a means for focusing said laser beam;

a means for moving a ferromagnetic sheet surface to be treated by said laser beam into the path of said laser beam within a predetermined distance from the focal plane of said focusing means;

wherein rotation of said rotatable means for deflecting translates said laser beam substantially transverse to the direction of movement of said sheet surface; and

said means for focusing having optical means for producing an elongate laser beam cross-section on said sheet surface, and said elongate beam cross section having a major axis aligned substantially parallel to the direction of translation of said laser beam across said sheet surface.

4,535,219

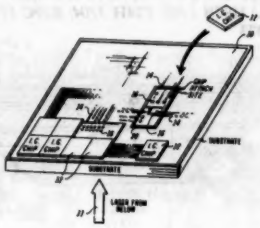
INTERFACIAL BLISTER BONDING FOR MICROINTERCONNECTIONS

John W. Sliwa, Jr., Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 12, 1982, Ser. No. 433,577

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LC **20 Claims**



1. A method for producing microinterconnections characterized by including the following steps,

providing a first support member bearing electrical circuit elements including first electrical contact means and first electrical trace means,

providing a second support member bearing electrical circuit elements including second electrical contact means and second electrical trace means,

placing said second support member in face-to-face spaced relationship with respect to said first support member,

aligning said second contact means with said first contact means, and

applying energy to said first support member for moving portions of said first support member, bearing ones of said first contact means, toward and into intimacy with aligned ones of said second contact means, and for heating said ones of said first contact means to bond aligned ones of said first and second electrical contact means.

4,535,220

INTEGRATED CIRCUITS

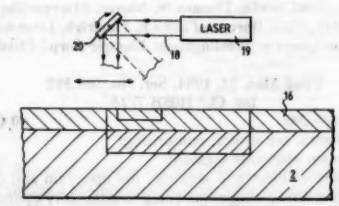
Anthony G. Cullis, Worcester; Hugh C. Webber, and Nigel G. Chew, both of Malvern, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 30, 1982, Ser. No. 430,381

Claims priority, application United Kingdom, Nov. 10, 1981, 8133926

Int. Cl.³ B23K *26/00*

U.S. Cl. 219—121 LM **3 Claims**



1. A method of providing electrical separation between electrical components on a single crystalline silicon substrate, the method comprising the steps of forming amorphous regions in the crystalline silicon substrate by selectively irradiating the silicon substrate with laser radiation of a wavelength less than 400 nanometers and a pulse length less than 10 nanoseconds so that most of the radiation is absorbed in the top 3,000 Å of the irradiated regions of the substrate which rapidly melts and rapidly freezes into an amorphous state, the amorphous regions forming electrically insulating regions adjacent single crystalline silicon regions of substrate.

4,535,221

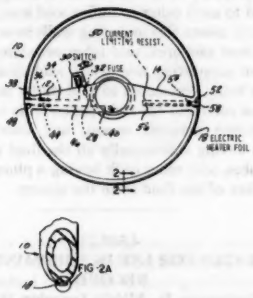
ELECTRICALLY HEATED STEERING WHEEL WITH ADHESIVELY ATTACHED FOIL STRIP HEATING ELEMENT

Herbert Holsworth, 1267 Muskingum, Pontiac, Mich. 48054

Filed Jul. 1, 1983, Ser. No. 510,275

Int. Cl.³ H05B *3/34*; B62D *1/10*

U.S. Cl. 219—204 **4 Claims**



1. In combination with a generally circular steering wheel having cross spokes, and mounted for rotation on a steering column, a heater arrangement comprising:

a strip of metal foil adhesively bonded to and extending substantially entirely about the outer periphery of said steering wheel, the outer surface of said metal foil coated with an insulating plastic film, said strip of metal foil being adhesively bonded directly to the surface of said steering wheel, and further including a cover disposed over said foil strip and said steering wheel outer periphery;

power supply means for causing an electrical current to be passed through said strip of metal foil, including a switch mounted to one of said spokes and power supply leads extending along said spoke and electrically connected to the ends of said strip of metal foil, whereby electrical current passed through said metal foil causes heating of said steering wheel.

4,535,222

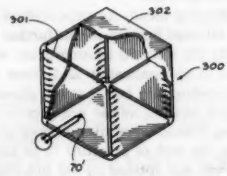
TEMPERATURE CONTROL SYSTEM

Walter K. Moen, Newport Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 655,331, Feb. 5, 1976, Pat. No. 4,386,650. This application Jul. 12, 1982, Ser. No. 396,992

Int. Cl.³ H05B *3/42*; F26B *23/06, 21/00*

U.S. Cl. 219—300 **4 Claims**



1. A temperature control system comprising:

a supply means for supplying fluid, the fluid acting as the temperature effecting agent for the temperature control system;

an outlet;

fluid conveying means for conveying the fluid from said supply means to said outlet;

temperature control means for regulating temperature of the fluid at said outlet, said temperature control means including a helix of electrically resistant tubing, said helix being connected to said fluid conveying means in fluid conveying relation such that the fluid passes through said helix;

fluid control means for regulating flow of the fluid through said fluid conveying means; and

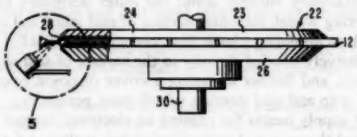
distribution network means for governing efflux of the fluid from the system such that the fluid is uniformly distributed in a desired area, said distribution network means including a plurality of tubes, said tubes being shaped and connected to each other to define said area, said distribution network means also including walls mounted to said tubes to enclose said area, said tubes providing the framework for and supporting said walls, said distribution network means being connected to said outlet in fluid conveying relation such that the fluid passes from said outlet to said distribution network means, said distribution network means having substantially all the fluid therein flow into said tubes, said tubes each having a plurality of apertures for efflux of the fluid from the system.

4,535,223

APPARATUS FOR USE IN TRIMMING MOLDED RECORDS

Harry H. Westerman, Jr., Middle Township, Hendricks County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 24, 1983, Ser. No. 544,830
Int. Cl.³ H05B *1/00*; B29C *17/12*
U.S. Cl. 219—354 **4 Claims**



1. Apparatus for use in trimming flash from an outer diameter of a record molded from a thermoplastic composition having a softening point in which the flash is secured to the outer diameter of the record by a circumferential web of thermoplastic composition, said web having a given width and a cross-sectional thickness which is substantially less than the flash and the outer diameter of the record; said apparatus comprising in combination;

(a) a holding means for receiving and holding a molded record to be trimmed, said holding means having upper and lower turntables each having outer edges for holding the record, said edges being approximately the same diameter as the outer diameter of the record,

(b) means for rotating said holding means in a predetermined plane of rotation, and

(c) infrared heating means for producing a beam of infrared heat, said infrared heating means further including means for focusing the infrared heating beam within a predetermined area of approximately said given width for length which is substantially less that the diameter of the web, said infrared heating means being positioned relative to said holding means whereby the infrared heating beam is focused on the web of a record to be trimmed while the record is held and rotated by the holding means:

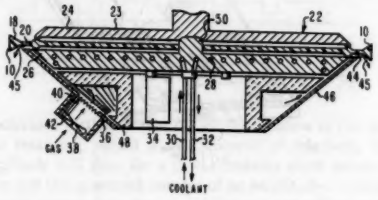
whereby said web can be selectively heated to a temperature above the softening point of the thermoplastic resin thereby facilitating the trimming of the flash from the outer diameter of the record.

4,535,224

APPARATUS FOR USE IN TRIMMING OF MOLDED RECORDS

Harry H. Westerman, Jr., Middle Township, Hendricks County, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Oct. 24, 1983, Ser. No. 544,829
Int. Cl.³ H05B *1/00*; F24H *3/04*; B29C *17/12*
U.S. Cl. 219—373 **6 Claims**



1. Apparatus for use in trimming of molded flash from an outer diameter of a record molded from a thermoplastic composition having a softening point wherein the molded flash is secured to the outer diameter of the record by a web of the thermoplastic composition which has a cross-sectional thickness which is substantially thinner than the outer diameter of the record and the flash; said apparatus comprising in combination:

(a) a holding means for receiving and holding an untrimmed molded record, said holding means having an outer diameter which is approximately the same as the outer diameter of the final molded record;

(b) manifold means for receiving and distributing a heated gas, said manifold means being positioned adjacent to the holding means and including an inlet port and a circumferential discharge orifice and guide means for selectively directing a heated gas introduced into the manifold means into heating contact with the web; and

(c) means for heating a gas to a predetermined temperature and imparting a predetermined rate of flow to said gas; said means being in communication with the inlet port of the manifold means, said predetermined temperature and rate of flow being sufficient to produce a heated gas flow exiting from the discharge orifice sufficient to selectively soften the web;

whereby the flash and web can be more readily removed and the outer diameter of the record more precisely trimmed.

4,535,225

HIGH POWER ARC HEATER

Charles B. Wolf, Irwin; Thomas N. Meyer, Murrysville; Maurice G. Fey, Plum Boro, and John E. Heidrich, Livermore, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 12, 1984, Ser. No. 588,595
Int. Cl.³ H05B *7/18*
U.S. Cl. 219—383 **40 Claims**

1. An electric arc heater, comprising:

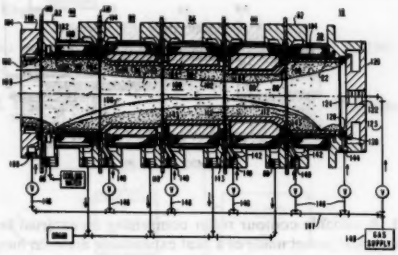
an upstream electrode segment;

a downstream electrode segment, the upstream and downstream electrode segments being substantially cylindrical, spaced apart, hollow, and axially aligned;

a plurality of electrically insulated interelectrode segments positioned intermediate the upstream electrode segment and the downstream electrode segment, the interelectrode segments being substantially cylindrical, hollow, axially spaced apart from each other and the electrode segments forming a series of axial gaps therebetween, and forming

an arcing chamber therein, the interelectrode segment adjacent the upstream electrode segment having an internal diameter less than the internal diameter thereof and the interelectrode segment adjacent the downstream electrode segment having an internal diameter less than or equal to the internal diameter thereof with the internal diameters of the interelectrode segments increasing in a stepwise manner in the downstream direction;

gas inlet means for admitting a gas into the arc chamber so as to form a boundary layer of gas about the surface thereof; and



DC power supply means adapted to be connected to the upstream electrode segment and the downstream electrode segment for forming an arc therebetween and extending through the interelectrode segments with one electrode segment connected as the anode and the other electrode segment connected as the cathode, the arc heating a portion of the admitted gas to form a core of arc-heated gas, the arc-heated gas and boundary layer of gas exiting the arc heater at the downstream end of the downstream electrode segment with the boundary layer of gas decreasing convective heat loss of the core region of hot gas to the segments while maintaining the electrical insulation between segments.

4,535,226

DOMESTIC ELECTRIC COOKING OVEN

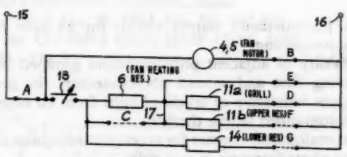
Bernard Logel, Gundershoffen, and Robert Koehl, Bischholtz, both of France, assignors to De Dietrich & Cie, Niederbronn les Bains, France

Continuation of Ser. No. 454,415, Dec. 29, 1982, abandoned. This application Jan. 14, 1985, Ser. No. 691,366

Claims priority, application United Kingdom, Jan. 6, 1982, 8200089

Int. Cl.³ H05B *1/02;* **F24C** *15/32;* **A21B** *1/22*

U.S. Cl. 219—400 **4 Claims**



1. A domestic electric cooking oven comprising a muffle which defines a chamber and in which are mounted at least one upper heating element, at least one lower heating element, an air circulating fan provided in a rear wall of the muffle for creating a current of air, a heating element associated with the fan and placed in the current of air from the fan, air conditioning means adapted to orient the air blown by the fan in accordance with substantially horizontal streams in the chamber defined by the muffle, and an electric switching device for connection to an electric power supply and for selectively connecting said heating elements and said fan to said supply, wherein said switching device comprises a given position in which given position it is capable of connecting said heating element associated with the fan in series with the upper heating element while connecting each of the fan and said lower heating element to said supply in parallel with said serially connected fan heating element and upper heating element.

4,535,227

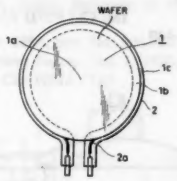
METHOD FOR HEATING SEMICONDUCTOR WAFER BY MEANS OF APPLICATION OF RADIATED LIGHT

Hiroshi Shimizu, Yokohama, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 538,934

Int. Cl.³ F27D *11/02;* **C23C** *13/08;* **H05B** *1/00*

U.S. Cl. 219—411 **15 Claims**



1. A method for heating a semiconductor wafer having a surface by means of application of light radiated from a light source, which method comprises arranging subsidiary heating means in contact with at least one of the surface of a circumferential edge and a surface portion lyin in a vicinity of the circumferential edge of the semiconductor wafer; and heating the semiconductor wafer by means of application of light radiated from the light source while additionally heating the semiconductor wafer principally at the surface portion lying in the vicinity of the circumferential edge by the subsidiary heating means.

4,535,228

HEATER ASSEMBLY AND A HEAT-TREATMENT METHOD OF SEMICONDUCTOR WAFER USING THE SAME

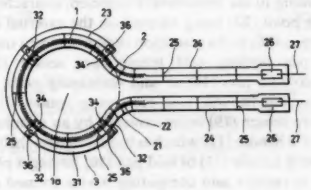
Yoshiki Mimura, Yokohama; Tetsuji Arai, Tachikawa; Hiroshi Shimizu, Yokohama, and Satoru Fukuda, Kawasaki, all of Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1983, Ser. No. 539,413

Claims priority, application Japan, Dec. 28, 1982, 57-227534; Dec. 28, 1982, 57-227535

Int. Cl.³ F27D *11/00;* **H05B** *1/00;* **C23C** *13/08*

U.S. Cl. 219—411 **6 Claims**



1. A heater assembly for heating a wafer to a uniform temperature in association with heating of the wafer by application of radiated light comprising:

a holder on which the wafer to be heat-treated is to be held in contact by gravity and means for heating principally a circumferential portion of the wafer, said means for heat-

ing including a heating device combined detachably with the holder, wherein the heating device has an elongated positioning arm which extends in one direction.

4,535,229

SAUCEPAN AND COVER FOR A COOKING UTENSIL, PARTICULARLY A STEAM PRESSURE COOKING PAN

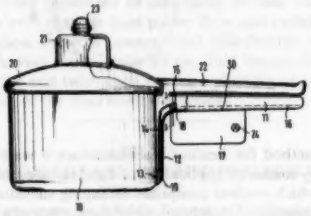
Kurt Wolf, Langwiesenweg, and Wolfram K. Andre, Eichenweg, both of Fed. Rep. of Germany, assignors to Kurt Wolf & Co. KG, Fed. Rep. of Germany

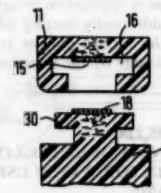
Filed Oct. 6, 1983, Ser. No. 539,482

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1982, 3238768

Int. Cl.³ F27D *11/00*

U.S. Cl. 219—440 11 Claims





1. A cooking vessel comprising a saucepan of heat conductive material and a cover, particularly a steam pressure cooker, to which heat is applied from an external heat source underneath said saucepan and to which a temperature-dependent resistor is attached as a temperature sensor and connected to a computing device for determination of the temperature inside said saucepan and for the transmission of electrical signals corresponding to the temperature detected, characterized by a measuring point (13) being located on the external surface of said saucepan (10) in the transition region between the pan wall and the pan bottom, said temperature sensor (19) being mounted to said pan (10) at said measuring point (13) in a heat-conducting fashion; said measuring point (13) and said temperature sensor (19) being covered by an attachment portion (12) of a handle (11) which is mounted detachably on said pan (10); said handle (11) of said pan (10) having a plug receptacle (16) to receive said computing device formed as a separate plug unit (17) in which connection contact (15) in communication with said temperature sensor (19) is provided to match counter-contact (18) provided on said plug unit (17); and said plug unit (17) being insertable mechanically in said plug receptacle (16), whereby said counter-contact (18) of said plug unit (17) and said connection contact (15) in said plug receptacle are in electrically-conductive contact.

4,535,230

VARIABLE PROFILE ROLLER PARTICULARLY FOR THE PAPER MAKING INDUSTRY

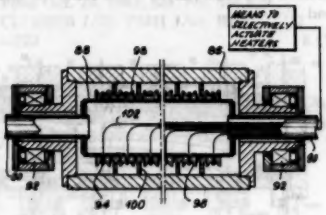
Francois M. P. Brieu, Saint-Cloud, France, assignor to Chiq Frote et Cie, Paris, France

Filed Apr. 9, 1982, Ser. No. 367,056

Claims priority, application France, Apr. 9, 1981, 81 07114

Int. Cl.³ B21B *27/06*

U.S. Cl. 219—470 5 Claims



1. A variable contour roller comprising an external hollow cylindrical jacket made of a heat expandable material mounted for rotation about its axis and a stationary internal member, the internal member including support means, successively space along the axis of said cylindrical member alternate discs of thermally insulating material and electric resistance radiant heaters mounted on said support means, the discs of thermally insulating material extending substantially wholly radially across the interior of hollow cylindrical member and the heaters being selectively actuatable to heat selected ring-shaped regions of said exterior cylindricakl member.

4,535,231

PHOTODETECTOR OUTPUT CIRCUIT

Shuhei Tanaka, Musashimurayama, Japan, assignor to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1982, Ser. No. 400,450

Claims priority, application Japan, Jul. 24, 1981, 56-116326

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 5 Claims

1. A photodetector output circuit for an auto focussing camera comprising:

a plurality of adjacent photodetectors grouped into pairs having first and second photodetectors for generating signals indicative of levels of light from an object to be photographed falling thereon;

a first analog shift register for receiving the signals from said first photodetectors in said pairs;

a second anlalog shift register for receiving the signals from said second photodetectors in said pairs;

a pair of first and second sample and hold circuits for successively sampling and holding said analog outputs from final states of said first and second shift registers, respectively, and for successively resetting held samples after they have overlapped in time; and

a comparator receptive as inputs of outputs from said first and second sample and hold circuits having gated output for delivering out digital logic signals representing when the received overlapped inputs have a level difference of

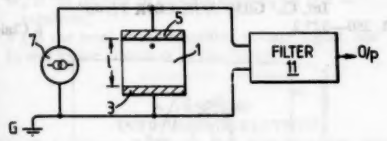
a predetermined value or higher thereby providing comparator output which rejects gradual changes in incident light.

4,535,232

METHOD OF BIASING A PHOTOCONDUCTIVE DETECTOR AND DETECTOR APPARATUS THEREFOR

Charles T. Elliott; Anthony M. White, and Howard J. Field, all of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 15, 1982, Ser. No. 441,863
Claims priority, application United Kingdom, Dec. 7, 1981, 8136752
Int. Cl.³ H01J 40/14
U.S. Cl. 250—206 20 Claims



11. A photosensitive detector apparatus, comprising:

detector means for detecting photon radiation and generating output signals, said detector means including at least one photoconductive element which has a bias versus responsivity curve including linear and non-linear portions and which has a photocarrier lifetime;

bias source means, connected to said detector means, for generating a bias having an alternating and a D.C. component, and providing a peak amplitude sufficient to drive operation of said photoconductive element into said non-linear portion of said bias versus responsivity curve, said alternating component having a cycle longer than said photocarrier lifetime; and

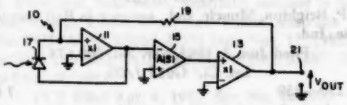
output means for processing said output signals to generate a photoresponse signal frequency component arising from said non-linear portion of said bias versus responsivity curve, and having a frequency different than the frequency of said alternating component.

4,535,233

BOOTSTRAP-TRANSIMPEDANCE PREAMPLIFIER FOR A FIBER OPTIC RECEIVER

Menachem Abraham, Lexington, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 22, 1982, Ser. No. 342,491
Int. Cl.³ H01J 40/14; H03F 17/00, 3/08
U.S. Cl. 250—214 A 9 Claims



1. A bootstrap-transimpedance preamplifier for receiving signals from a capacitive current source comprising:

bootstrap buffer means having an input connected to the capacitive current source for receiving signals therefrom, and for generating an output signal in response to signals from the capacitive current source;

voltage amplifer means having an input connected receive the output signal from the bootstrap buffer means and for generating an output signal in response thereto;

second buffer means connected to the output of said voltage amplifier means for generating an output signal in response to the output signal from said voltage amplifier means; and

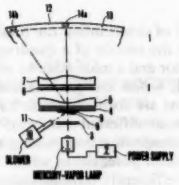
feedback means connected to the output of said second buffer means and the input of said bootstrap buffer means for coupling a signal proportional to the output signal from said second buffer means to the input of said bootstrap buffer means.

4,535,234

LIGHT EXPOSURE APPARATUS WITH COOLING MEANS

Takashi Fujimura; Katsuyu Takahashi, and Masahiro Nishizawa, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,606
Claims priority, application Japan, Oct. 1, 1980, 55-135862
Int. Cl.³ H01J 7/24
U.S. Cl. 250—238 5 Claims



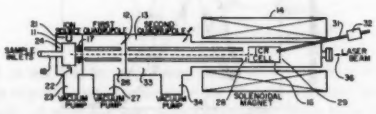
1. In a light exposure system having a lamp house containing a lamp simultaneously emitting ultraviolet rays and heat rays, the improvement comprising a plurality of spaced glass optical elements for transmitting light from said lamp and lamp house, said glass optical elements each having an optical characteristic which varies with temperature, and means for controlling cooling pressure flow of a gas on the light incident side of said optical element nearest said lamp house in order to cool said optical elements thereby to minimize influence of said heat rays upon the ultraviolet rays passed by said optical elements.

4,535,235

APPARATUS AND METHOD FOR INJECTION OF IONS INTO AN ION CYCLOTRON RESONANCE CELL

Robert T. McIver, Jr., Irvine, Calif., assignor to Finnigan Corporation, San Jose, Calif.

Filed May 6, 1983, Ser. No. 492,473
Int. Cl.³ B01D 59/44
U.S. Cl. 250—282 13 Claims



13. The method of conducting ion cyclotron resonance analysis of samples in an ion resonance spectrometer including an ion analyzer cell which comprises the steps of ionizing the sample outside of the homogeneous magnetic field associated with the spectrometer, selecting ions in a predetermined mass range and introducing into the analyzer cell the selected ionized atoms.

4,535,236

APPARATUS FOR AND METHOD OF OPERATING QUADRUPOLE MASS SPECTROMETERS IN THE TOTAL PRESSURE MODE

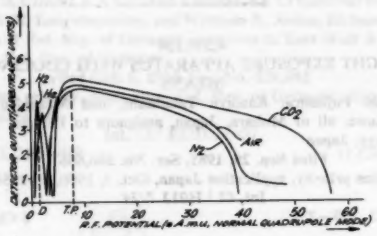
Jonathan H. Batey, Kingsley, England, assignor to VG Instruments Group Limited, England

Filed Feb. 23, 1984, Ser. No. 582,789

Claims priority, application United Kingdom, Feb. 25, 1983, 8305228

Int. Cl.³ H01J 49/42

U.S. Cl. 250—292 **17 Claims**



1. A method of determining the total pressure of a gas mixture present in the source of a quadrupole mass spectrometer having a detector and a mass filter to which only an RF potential is supplied, when the gas mixture contains components from which ions are formed which have maximum transmission efficiencies at different values of said RF potential, the improvement comprising maintaining the RF supply to said mass filter at a first potential at which ions of a first range of m/e values are efficiently transmitted and determining the ion current falling on said detector, and subsequently maintaining said RF supply at one or more further potentials at which ions of one or more further ranges of m/e values are efficiently transmitted and determining the ion current falling on the detector at each of said further potentials, and combining signals indicative of all said ion currents to produce an indication of the total pressure of the said gas mixture.

4,535,237

RADIATION IMAGE RECORDING AND REPRODUCING METHOD

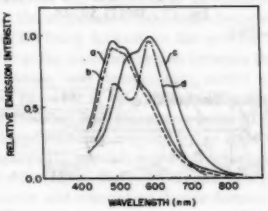
Kenji Takahashi, and Takashi Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 13, 1983, Ser. No. 560,924

Claims priority, application Japan, Dec. 15, 1982, 57-218393

Int. Cl.³ G03C 5/16; C09K 11/46

U.S. Cl. 250—327.2 **6 Claims**



1. A radiation image recording and reproducing method comprising steps of:

(i) causing a radiation image storage panel to absorb a radiation having passed through an object or having radiated from an object, the radiation image storage panel containing a divalent europium activated barium fluorobromide phosphor having the bromine-containing portion stoichiometrically in excess of the fluorine and showing a stimulation spectrum in which the emission intensity at the stimulation wavelength of 500 nm is higher than the emission intensity at the stimulation wavelength of 600 nm;

(ii) exposing said radiation image storage panel to an electromagnetic wave having a wavelength within the range of 550–800 nm to release the radiation energy stored therein as light emission; and

(iii) detecting the emitted light.

4,535,238

RADIATION IMAGE RECORDING AND REPRODUCING METHOD

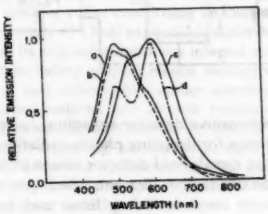
Kenji Takahashi, and Takashi Nakamura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 13, 1983, Ser. No. 560,815

Claims priority, application Japan, Dec. 15, 1982, 57-218394

Int. Cl.³ G03C 5/16; C09K 11/46

U.S. Cl. 250—327.2 **6 Claims**



1. A radiation image recording and reproducing method comprising steps of:

(i) causing a radiation image storage panel to absorb a radiation having passed through an object or having radiated from an object, the radiation image storage panel containing a divalent europium activated barium fluorobromide phosphor having the bromine-containing portion stoichiometrically in excess of the fluorine and showing a stimulation spectrum in which the emission intensity at the stimulation wavelength of 500 nm is higher than the emission intensity at the stimulation wavelength of 600 nm;

(ii) exposing said radiation image storage panel to an electromagnetic wave having a wavelength within the range of 400–550 nm, the wavelength of 550 nm being exclusive, to release the radiation energy stored therein as light emission; and

(iii) detecting the emitting light.

4,535,239

METHOD AND APPARATUS FOR REMOTE MEASUREMENT OF A PARTICULATE MATTER ON A MOVING SHEET

Andrew P. Brighton, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed Jun. 3, 1983, Ser. No. 500,675

Int. Cl.³ G01J 1/00

U.S. Cl. 250—339 **7 Claims**

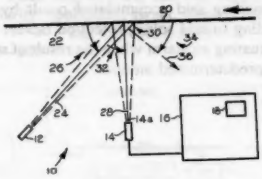
1. A method of measuring the particulate coating material on a substrate, comprising:

directing infrared energy having a wave length of about 940 nanometers at a substrate at an angle of about 45°,

detecting infrared energy from the particulate material along a line that is normal to the substrate and lying at an angle at 45° from the direction from the incident infrared energy,

generating a voltage from the detected infrared energy,

amplifying the voltage signal to provide a voltage level from which coating weight can be derived by the relationship



$$W_p = \log_{10}^{-1} \frac{(V_R - k_1)}{k_2},$$

where

W_p is the density of coating material on one surface of the substrate,

V_R is the level of the amplified voltage signal, and

k_1 and k_2 are constants of the system.

4,535,240

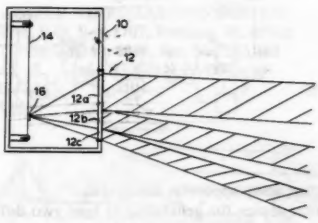
INTRUDER DETECTION

John P. C. Vigurs, 7, Church Rd., East Molesley, Surrey, England

Filed Sep. 23, 1983, Ser. No. 535,384

Int. Cl.³ B42F *13/00*

U.S. Cl. 250—342 **6 Claims**



1. An intruder detector comprising a sensor responsive to changes in the level of incident radiation and an imaging system for focusing energy from only monitored zones of an area of surveillance onto the sensor, the imaging system comprising a window constructed as a flat, integrally formed, segmented Fresnel lens of which each segment is operative to focus radiation from a different respective monitored zone onto the sensor.

4,535,241

MEASURING THE CONCENTRATION OF GASEOUS HYDROGEN FLUORIDE

John E. Eberhardt, Sans Souci, Australia, assignor to Australian Atomic Energy Commission, New Wales, Australia

PCT No. PCT/AU82/00055, § 371 Date Nov. 17, 1982, § 102(e) Date Nov. 17, 1982, PCT Pub. No. WO82/03687, PCT Pub. Date Oct. 28, 1982

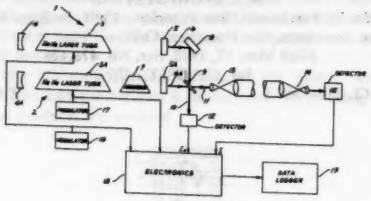
PCT Filed Apr. 8, 1982, Ser. No. 444,900

Claims priority, application Australia, Apr. 13, 1981, PE8425; May 13, 1981, PE8858

Int. Cl.³ G01N *21/35*

U.S. Cl. 250—339 **13 Claims**

1. A method for quantitatively determining the concentration of gaseous hydrogen fluoride in a medium containing gaseous hydrogen fluoride, characterised in that said method comprises combining the results of (a) a measurement of the transmission or absorption of a laser beam at a first frequency corresponding to a neon 3 p_4–2 s_2 transition through said medium containing gaseous hydrogen fluoride, and (b) a measurement of the transmission or absorption of a laser beam at a second frequency excluding said first frequency, through said medium containing gaseous hydrogen fluoride.



4,535,242

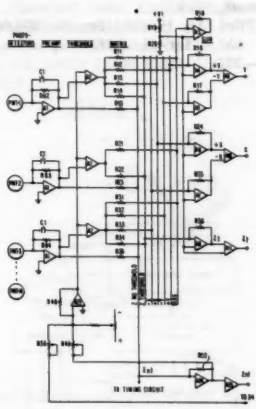
METHOD AND A CIRCUIT FOR PROCESSING PULSES OF A PULSE TRAIN

Franciscus J. Dirkse, Nieuwkoop, Netherlands, and Gerardus H. Kulberg, deceased, late of Noorden, Netherlands (by Julia F. Kulberg-Nierstrasz, heiress), assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Mar. 3, 1983, Ser. No. 471,915

Int. Cl.³ G01T *1/161*

U.S. Cl. 250—363 S **55 Claims**



1. A method for processing pulses of a pulse train such that tails of pulses which precede a pulse to be processed are eliminated, wherein said tails of said preceding pulses have a known and constant decay curve, the method comprising the following steps:

(a) producing a signal at the occurrence of a pulse to be processed, which signal extrapolates the known and constant decay curve of the tail of a preceding pulse,

(b) superimposing said extrapolating signal with said pulse to be processed to form a differential signal,

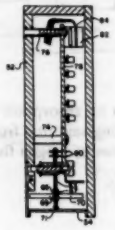
(c) providing said differential signal for processing.

4,535,243

X-RAY DETECTOR FOR HIGH SPEED X-RAY SCANNING SYSTEM

Kristian R. Peschmann, San Francisco, Calif., assignor to Imatron Associates, San Francisco, Calif.

Filed Mar. 17, 1983, Ser. No. 476,426
Int. Cl.³ G01T 1/20
U.S. Cl. 250—363 S **5 Claims**



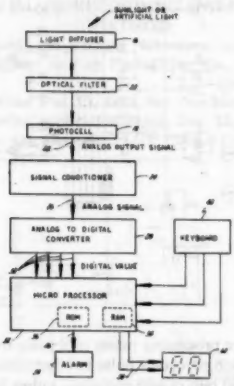
1. An X-ray detector for use in a high speed radiation scanning system comprising an elongated scintillator crystal having two opposing ends, a photodiode, means attaching said photodiode to one end of said crystal, reflection means on the opposite end of said crystal whereby said crystal functions as a light pipe in directing light to said photodiode, and an active low pass filter and amplifier means connected to said photodiode for amplifying electrical signals from said photodiode, said active low pass filter and amplifier means comprising a first operational amplifier having a first filter pole and a second operational amplifier having two filter poles.

4,535,244

PHOTODOSIMETER

Robert E. Burnham, Plymouth, Mich., assignor to BPA Calscan, Inc., Plymouth, Mich.

Filed May 19, 1983, Ser. No. 496,062
Int. Cl.³ G01J 5/32
U.S. Cl. 250—372 **7 Claims**



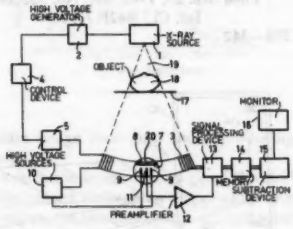
1. A photodosimeter comprising:
a housing having an opening,
means mounted beneath said opening for generating an output signal having a magnitude proportional to the intensity of ultraviolet radiation entering said housing opening,
means for manually inputting and storing a value corresponding to the solar protection factor of a sunscreen material,
means for accumulating said output signals and for storing the accumulated result,
means for dividing said accumulated result by said value corresponding to said solar protection factor,
means for actuating an alarm when the result of said division exceeds a predetermined amount.

4,535,245

WAVELENGTH-SENSITIVE RADIOGRAPHY APPARATUS

Frans W. Zonneveld, and Cornelis Kramer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 311,563, Oct. 15, 1981, abandoned.
This application Apr. 23, 1984, Ser. No. 602,625
Claims priority, application Netherlands, Nov. 13, 1980, 8006216
Int. Cl.³ G01T 1/185
U.S. Cl. 250—385 **5 Claims**



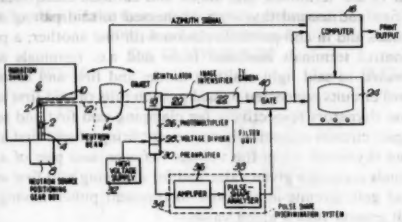
1. A radiography apparatus comprising:
a radiation source for generating at least two different energy spectra of radiation;
a radiation detector for measuring the radiation from the source which is incident thereon, said detector comprising an ionization chamber having first and second ends, the first end being nearer to the radiation source than the second end, said chamber having an entrance window at the first end thereof;
a high voltage electrode in the ionization chamber extending in a direction from the first end toward the second end of the detector, said high voltage electrode having an electric potential;
a signal electrode in the ionization chamber extending in a direction from the first end toward the second end of the detector, said signal electrode being separated from the high voltage electrode by a space which is located behind the entrance window, said signal electrode having electric potential;
an auxiliary electrode in the ionization chamber and arranged substantially parallel to and near the entrance window; and
a voltage source having an output electrically connected to the auxiliary electrode, the output of said voltage source selectively switchable between two different values so as to selectively favor the measurement of radiation absorbed at locations toward the first end of the detector or to selectively favor the measurement of radiation absorbed at locations toward the second end of the detector.

4,535,246

FAST NEUTRON RADIOGRAPHY SYSTEM

Gad Shani, Beer-Sheva, Israel, assignor to Ben-Gurion University of the Negev Research & Development Authority, Israel

Filed Aug. 6, 1982, Ser. No. 405,776
Claims priority, application Israel, Aug. 7, 1981, 63529
Int. Cl.³ G01T 3/00
U.S. Cl. 250—390 12 Claims



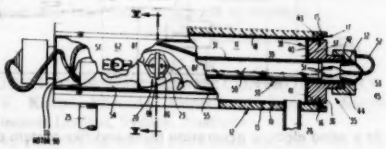
1. A system for gamma-ray interference-free fast-neutron radiography, comprising a radiation detector adapted to distinguish between fast-neutron and gamma radiation passing through an object, imaging means transducing object-point related signals generated by said object-modified neutron and gamma radiation in said radiation detector; pulse-shape discrimination and gating means for passing only neutron-induced image-producing pulses, and for filtering out the gamma-ray induced, interfering signals; and utilization means for receiving said neutron-induced image-producing pulses.

4,535,247

WATER STERILIZATION SYSTEM

Mark E. Kurtz, P.O. Box 1707, Rutland, Vt. 05701

Filed Jul. 11, 1983, Ser. No. 512,483
Int. Cl.³ G01N 21/00
U.S. Cl. 250—436 18 Claims



1. A water sterilization system which includes

a sterilizer comprising an elongated cylindrical housing of a plastic normally degraded by ultraviolet light, having opposing ends and an inside wall, said inside wall being covered with a protective liner to expose an ultraviolet light-reflecting inner surface; a hollow, open-ended cylindrical sleeve of a material transmitting ultraviolet light, extending coaxially within said housing, and having an outer surface spaced from said inner surface to form an annular water chamber; closure means affixed at each of said opposing ends for sealing said chamber, including a plastic insert plug having an inside surface lined with a protective cover to expose an ultraviolet light-reflecting interior surface; water inlet and outlet conduits in communication with said chamber and adapted to connect to a central water supply; a UV electric lamp enclosed within said sleeve, said lamp carrying terminals to receive electric power from leads fed into said sleeve; together with a lamp power supply connected electrically to said lamp terminals and adapted to connect to an AC power line; in combination with

fail safe control mechanism comprising a normally closed water valve in said inlet or outlet conduit; and a series electrical circuit adapted to be AC line-powered and including a photoresistor adapted to receive light from said lamp, the resistance of said photoresistor decreasing as the intensity of the light increases, and a stallable electric motor coupled mechanically to said water valve to hold said valve open so long as said photoresistor receives sufficient light than an operating voltage appears across said motor;

whereby UV-induced degradation of the plastic wetted surfaces and contamination of the water by the degradation products are avoided.

4,535,248

METHOD FOR DETECTING AFLATOXIN IN ALMONDS

John E. Schade, Walnut Creek, and A. Douglas King, Jr., Martinez, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 24, 1984, Ser. No. 643,990
Int. Cl.³ G01N 21/33; B07C 5/342
U.S. Cl. 250—459.1 10 Claims

1. A method for detecting aflatoxin contamination in almonds, which comprises:

(a) exposing almond kernels to long wave ultraviolet light and

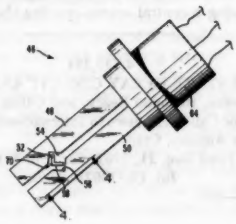
(b) detecting the presence of aflatoxin as determined by violet-purple fluorescence.

4,535,249

BENCHMARK DETECTOR

John W. Reeds, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Jun. 17, 1983, Ser. No. 505,564
Int. Cl.³ G01N 23/00; H01L 21/30
U.S. Cl. 250—491.1 14 Claims



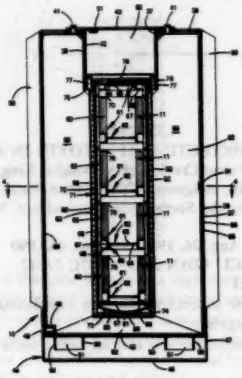
1. A benchmark detector consisting of only first and second light pipes lying adjacent each other, said light pipes each having a notch therein so that said notches face each other and define two corners of an opening between said light pipes, a scintillator material on each of said light pipes adjacent said notches so that electrons striking the scintillator material generate photons in the associated light pipes, said detector being for positioning substantially parallel to the surface of the target carrying a benchmark and with a line between the light pipes lying at an acute angle with respect to the axes of movement of the target carrying the benchmark so that comparative sensing of photons in said first and second light pipes indicates the position of the benchmark.

4,535,250

CONTAINER FOR RADIOACTIVE MATERIALS

Stanley R. Fields, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 30, 1984, Ser. No. 615,210
Int. Cl.³ G21C *19/40*
U.S. Cl. 250—507.1 **15 Claims**



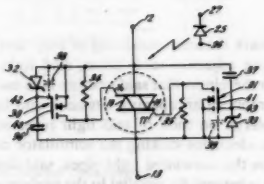
1. A container for shipping and storing radioactive material comprising: an outer shell, an inner payload package mounted concentrically within said shell, a radiation shielding material interposed between said pay load package and said shell, said payload package comprising a basket for housing a plurality of canister assemblies containing said radioactive material, said basket comprises a side wall and an end wall supporting alternate canister assemblies and spaces in a stacked relation therein thin, said canister assemblies arranged in a longitudinally spaced relation, a plurality of spacers associated with said canister assemblies, respectively, each spacer having a base member longitudinally spacing adjacent canister assemblies and a sleeve portion surrounding said associated canister assembly wherein said base of each spacer comprises a web portion for supporting a canister assembly and a peripheral rim of thickness adapted to rest on an adjacent canister assembly, said web having a central access opening there through.

4,535,251

A.C. SOLID STATE RELAY CIRCUIT AND STRUCTURE

Thomas Herman, Redondo Beach, and Oliver Williams, Camarillo, both of Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.

Filed Dec. 21, 1982, Ser. No. 451,792
Int. Cl.³ G02B *27/00*
U.S. Cl. 250—551 **24 Claims**



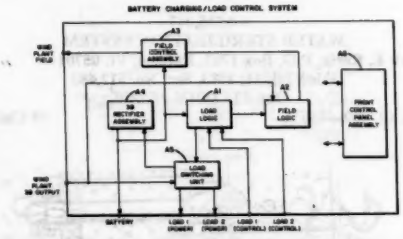
1. A solid state a.c. relay comprising first and second thyristors each having respective anode and cathode electrodes and a respective gate circuit; each of said thyristors being formed in separate respective first and second semiconductor chips and being of the lateral conductivity type, wherein said anode and cathode electrodes of each of said thyristors are on the same first surface of their said first and second chips respectively; said first surface of said first and second chips being optically sensitive, whereby said first and second chips can be switched to conduct current by illuminating said one surface; said solid state relay further comprising a light emitting diode arranged to illuminate said first surfaces upon its energization; a pair of a.c. terminals; said anode and cathode electrodes of said first and second thyristors connected to said pair of a.c. terminals and in anti-parallel relation with one another; a pair of control terminals insulated from said a.c. terminals and connected to said light emitting diode; and first and second control circuits connected to said gate circuits of said first and second thyristors respectively for clamping said first and second gate circuits respectively to prevent firing of said first and second thyristors when the voltage between said pair of a.c. terminals exceeds a given value and for clamping said first and second gate circuits in response to transient pulses having a dV/dt greater than a given value.

4,535,252

WIND ELECTRIC GENERATION PLANT AND SYSTEM WITH IMPROVED ALTERNATOR FIELD EXCITATION

Marcellus L. Jacobs, and Paul R. Jacobs, both of Fort Myers, Fla., assignors to Jacobs Wind Electric Company, Minneapolis, Minn.

Filed Apr. 29, 1983, Ser. No. 489,951
Int. Cl.³ H02P *9/04*; F03D *9/00*
U.S. Cl. 290—44 **7 Claims**



1. In a wind electric generation plant and like system of the type including a wind driven propeller or the like supported at the top of a tower and connected to drive an alternator supported on the tower to generate electrical energy, storage battery means connected to be charged by the alternator, electrical control circuit means supplying current from the storage battery means to the field winding of the alternator, load means requiring A.C. energy connected with the A.C. output circuit of the alternator, and circuit means connected with said electrical control circuit means and operable to selectively supply alternator A.C. energy to the load means and a charging circuit for the storage battery means, said circuit means including means to automatically divert the supply of alternator A.C. energy to and from said load means and said charging circuit thereby maintaining a constant load on the wind electric plant to thereby insure quiet operation of said wind electric plant even at times of strong wind conditions, the improvement including:

alternator overspeed detection means for detecting the occurrence of an overspeed condition of said alternator;

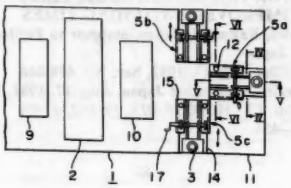
means to reduce the field current of said alternator to a predetermined low rate level;

and means to provide the said predetermined low rate level of field current to the said alternator during the time period of the detected occurrence of said overspeed condition.

4,535,253
MOBILE ELECTRICAL APPARATUS

Kenichi Ootsuka, and Yoshikazu Miyake, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1983, Ser. No. 493,239
Claims priority, application Japan, May 20, 1982, 57-75302[U]
The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.
Int. Cl.³ H02B 5/00
U.S. Cl. 307—9 6 Claims

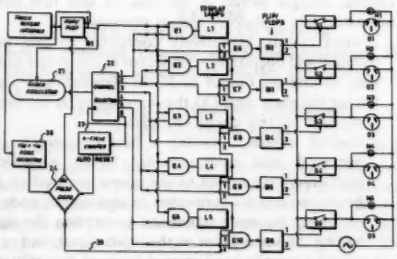


1. A mobile electrical apparatus comprising:
a vehicle body having length and width dimensions;
a main electrical apparatus mounted on said vehicle body;
three holding means mounted on said vehicle body;
three lightning arresters disposed adjacent to one another, each lightning arrester being mounted on one of said holding means;
said holding means acting to move said lightning arresters in different predetermined directions by a linear sliding movement from a retracted position within said dimensions of said vehicle body for transporting to an extended position beyond said dimensions of said vehicle body for operation;
whereby said lightning arresters are in right triangular positional relationship when in the extended position so that equidistant interphase insulation is obtained.

4,535,254
TOUCH-OPERATED POWER CONTROL DEVICE

Dilip K. Khatri, Miranda, Australia, assignor to Electrical Equipment Limited, Sydney, Australia

PCT No. PCT/AU82/00140, § 371 Date Apr. 22, 1983, § 102(e) Date Apr. 22, 1983, PCT Pub. No. WO83/00780, PCT Pub. Date Mar. 3, 1983
PCT Filed Aug. 26, 1982, Ser. No. 492,025
Claims priority, application Australia, Aug. 26, 1981, PF0436
Int. Cl.³ H02J 3/14
U.S. Cl. 307—38 7 Claims

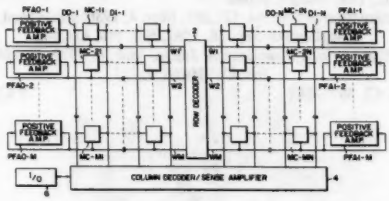


1. A selective power control device for the connection of electric power from a source to a selected one of a plurality of power lines associated with individual electrical functions or applicances, comprising a visual display to the operator of the functions or appliances available to him, operator-controlled sensor means, cycling control means including a clock oscillator responsive to a first signal from said sensor means to initiate repeated cycling providing an automatic successive identification to said operator of individual ones of said functions or appliances, means responsive to a second signal from said sensor means to halt said successive identification at a selected one of said functions or appliances, switches for controlling power application to said power lines, an electronic counter having a plural outputs connected to respective ones of said switches to switch on power from said source to said power line associated with said selected one of said functions or appliances, and an auto-reset counter connected to an output of said electronic counter to de-energise said clock oscillator after cycling through a predetermined number of repetitions.

4,535,255
POSITIVE FEEDBACK AMPLIFIER CIRCUITRY

Kiyofumi Ochii, Yokohama; Masami Masuda, Tokyo, and Takeo Kondo, Yokosuka, all of Japan, assignors to Tokyo-Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 452,127, Dec. 22, 1982, abandoned, which is a division of Ser. No. 170,687, Jul. 21, 1980, Pat. No. 4,379,346. This application Nov. 8, 1984, Ser. No. 669,724
Claims priority, application Japan, Jul. 26, 1979, 54-95526
Int. Cl.³ H03K 5/01, 19/094
U.S. Cl. 307—264 5 Claims



1. A positive feedback amplifier circuit responsive to a clock signal and an I/O signal, said amplifier circuit comprising:
an I/O terminal receiving said I/O signal;
a clock receiving terminal receiving said clock signal;
first and second power source terminals;
a first MOS transistor whose current path is connected at one end to said first power source terminal and whose gate is connected to said clock receiving terminal;
a second MOS transistor whose current path is connected between the other end of said first MOS transistor's current path and said second power source terminal and whose gate is connected to said I/O terminal;
a third MOS transistor whose current path is connected between said first power source terminal and the gate of said second MOS transistor and whose gate is connected to the junction between said first and second MOS transistors; and
resistive means connected between said first power source terminal and the gate of said third MOS transistor.

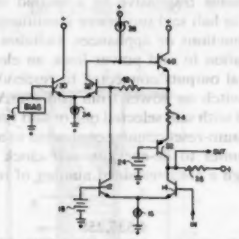
4,535,256
INTEGRATED VIDEO AMP WITH COMMON BASE LATERAL PNP TRANSISTOR

Daniel L. Reneau, Elmhurst, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 26, 1983, Ser. No. 488,889
Int. Cl.³ H03F 3/18
U.S. Cl. 307—264 10 Claims

1. In an integrated circuit, signal translation means for DC coupling an input signal from an NPN transistor to develop a level shifted output signal without degradation of frequency response, comprising:

a high gain amplifier, having an input terminal and an output terminal, being coupled to said NPN transistor at said input terminal for transforming input signal current therefrom to a voltage at said output terminal;



a lateral common base connected PNP transistor having an emitter and a collector; and

means for supplying the emitter of said PNP transistor with said voltage for developing a level shifted output signal responsive thereto at said collector.

4,535,257

COMPARATOR CIRCUIT

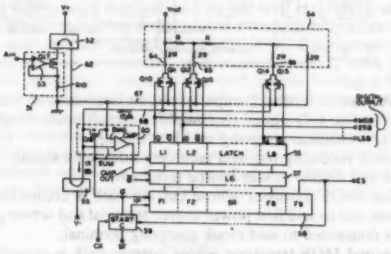
Kyuichi Hareyama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 127,201, Mar. 4, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 424,866

Claims priority, application Japan, Mar. 6, 1979, 54-25864

Int. Cl.³ H03K *5/153*

U.S. Cl. 307—362 **9 Claims**



1. A comparator circuit comprising a differential amplifier circuit means having a pair of input terminals, means for supplying a fixed potential to a first of said input terminals, means for supplying to a second of said input terminals an input potential which maintains a level that is different from said fixed potential during at least a comparison period of time, short circuiting means connected between said first and second input terminals for operatively completing a short circuit therebetween prior to the start of said comparison period, control means for periodically driving said short circuiting means to complete and remove said short circuit a plurality of times during said comparison period, said short circuiting means including a field effect transistor coupled directly between said first and second input terminals and being driven responsive to said control means to periodically short circuit and remove said short circuit between said input terminals, whereby a potential at said second input terminal is periodically made equal to said fixed potential every time said short circuiting means is driven into a short circuiting condition during said comparison period, and comparison means responsive to differences between said input potential and said fixed potential when said short circuit is removed during said comparison period, whereby a comparison result is indicated every time said short circuiting means is driven to remove said short circuit.

4,535,258

TRANSISTOR-TRANSISTOR LOGIC CIRCUIT WITH IMPROVED SWITCHING TIMES

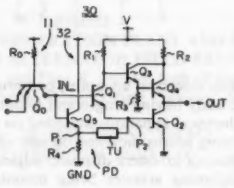
Tetsu Tanizawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 17, 1982, Ser. No. 408,846

Claims priority, application Japan, Aug. 17, 1981, 56-128468

Int. Cl.³ H03K *19/013, 19/092, 17/04*

U.S. Cl. 307—454 **10 Claims**



1. A transistor circuit operatively connectable to a power supply line and a ground line, comprising:

an input terminal operatively connected to reveive an input signal;

an output terminal;

a phase-inverting transistor of a first conductivity type, operatively connected to said input terminal, having a base for receiving the input signal, having a collector operatively connected to the power supply line and having an emitter, and generating an output signal;

first and second output transistors, each having a base operatively connected to the emitter and collector, respectively, of said phase inverting transistor and said first transistor having a collector operatively connected to the output terminal, and said second transistor having a collector operatively connected to the power supply line, and said first and second output transistors being alternately turned on and off in response to the output signal of said phase-inverting transistor; and

a pull-down circuit, operatively connected to said input terminal and said first output transistor, for discharging electric charges stored in the base of said first output transistor, said pull-down circuit comprising:

a control circuit, operatively connected to said input terminal and operatively connected to the power supply line, having an output node for generating a signal having the same phase as the input signal at the output node, said control circuit includes:

a control transistor, having a base operatively connected to said input terminal, having a collector operatively connected to the power supply line, and having an emitter connected to said output node for receiving the input signal and generating the signal having the same phase as the input signal; and

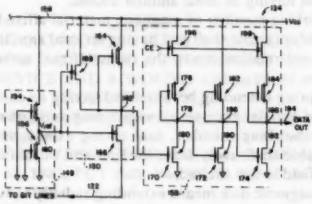
a resistor operatively connected between the emitter of said control transistor and the ground line; and

two-terminal impedance means, operatively connected between the base of said first output transistor and the output node of said control circuit, for providing an impedance.

4,535,259
SENSE AMPLIFIER FOR USE WITH A SEMICONDUCTOR MEMORY ARRAY

George Smarandoiu, Palo Alto, and George Perlegos, Fremont, both of Calif., assignors to Seeq Technology, Inc., San Jose, Calif.

Filed Jun. 18, 1982, Ser. No. 389,819
Int. Cl.[3] G11C 7/06, 9/00, 17/04, 11/40
U.S. Cl. 307—530 5 Claims



1. A sense amplifier apparatus for detecting the presence or absence of current flow through a device, which device is connected to an electrical conductor for periodically drawing current therefrom, said sense amplifier apparatus comprising:

a voltage node connectable to the electrical conductor;

a current source means connected to said voltage node for supplying the electrical conductor with current and for raising the voltage at said voltage node to a first predetermined voltage level, said current source means including a first transistor;

a voltage source means connected to said voltage node for charging the electrical conductor to a second predetermined voltage level less than said first predetermined voltage level, said voltage source means including a second transistor having a large current and voltage capacity relative to said first transistor; and

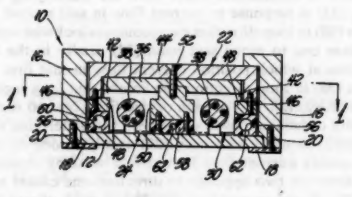
a transfer means connected between said voltage node and the electrical conductor for clamping the voltage on the electrical conductor at said second predetermined voltage level and for permitting said current source means to raise the voltage at said voltage node to said first predetermined voltage level when current is not flowing through the device while permitting the voltage at said voltage node to drop to said second predetermined voltage level when current is flowing through the device, said transfer means including a third transistor having a large current and voltage capacity relative to said first transistor.

4,535,260
MAGNETIC LINEAR MOTOR

Robert J. Pritchard, Lansdale, and Kevin Lindenmuth, Sellersville, both of Pa., assignors to Teleflex Incorporated, Limerick, Pa.

Filed Oct. 15, 1984, Ser. No. 660,540
Int. Cl.[3] H02K 41/00
U.S. Cl. 310—12 9 Claims

1. A magnetic linear motor assembly (10) comprising; a platen defining a planar surface presenting a grid of magnetic (12) and nonmagnetic (14) zones spaced from one another along an axis (A) of relative movement a distance pn where n is any whole number and p is the pitch of the grid as defined by the distance between center lines of next adjacent magnetic zones (12) or of next adjacent nonmagnetic zones (14), a head (22) movable along said axis (A) over said platen, said head (22) including a first plurality (24) of U-shaped laminations extending transversely to said axis (A) and disposed on adjacent centerlines spaced $p(n\pm\frac{1}{2})$ apart with the lower extremity of one leg (26, 28') of each lamination being shorter than the other long leg (26', 28) so as to be spaced farther above said magnetic zones (12) of said platen and with each short leg (26, 28') being sandwiched between the axially aligned long legs (26, 28') of the next adjacent laminations so that the first legs (26, 26') of said laminations are alternately short and long and the second legs (28, 28') of said laminations are alternately short and long, said head including a second plurality (30) of U-shaped laminations extending transversely to said axis (A) of movement and disposed on adjacent centerlines spaced $p(n+\frac{1}{2})$ apart with the lower extremity of one leg (26, 28') of each lamination being shorter than the other long leg (26', 28) thereof so as to be spaced farther above said magnetic zones (12) of said platen and with each short leg (26, 28') being sandwiched between the axially aligned long legs (26', 28) of the next adjacent laminations so that the first legs (26, 26') of said second plurality of laminations (30) are alternately short and long as are the second legs (28, 28') thereof, said laminations of said first plurality (24) being transversely aligned with the laminations (26, 26') of said second plurality (30) and with said first (26, 26') and second (28, 28') legs thereof being alternately short and long across aligned laminations of said first and second pluralities (24, 30) aligned transversely of said axis (A) of movement, said head (22) including a third plurality (32) of U-shaped laminations extending transversely to said axis (A) of movement and disposed on adjacent centerlines spaced $p(n\pm\frac{1}{2})$ apart with the lower extremity of one leg (26, 28') of each lamination being shorter than the other long leg (26, 28') thereof so as to be spaced farther above said magnetic (26, 28') zones (12) of said platen and with each short leg (26, 28') being sandwiched



between the axially aligned long legs (26', 28) of the next adjacent laminations to that the first legs (26, 26') of said third plurality (32) of laminations are alternately short and long as are the second legs (28, 28') thereof, said head (22) including a fourth plurality (34) of U-shaped laminations extending transversely to said axis (A) of movement and disposed on adjacent centerlines spaced $p(n\pm\frac{1}{2})$ apart with the lower extremity of one leg (26, 28') of each lamination being shorter than the other long leg (26', 28) thereof so as to be spaced farther above said magnetic zones (12) of said platen and with each short leg (26, 28') being sandwiched between the axially aligned long legs (26', 28) of the next adjacent laminations so that the first legs (26, 26') of said fourth plurality (34) of laminations are alternately short and long as are the second legs (28, 28') thereof, said laminations of said third plurality (32) being transversely aligned with the laminations of said fourth plurality (34) and with said first (26, 26') and second (28, 28') legs thereof being alternately short and long across aligned laminations of said third (32) and fourth (34) pluralities aligned transversely of said axis (A) of movement, first bias magnet means (36) establishing magnetic flux for polarizing said first (26, 26') and second (28, 28') legs of said first plurality (24) of laminations (26, 26') in opposite polarity to said first (26, 26') and second (28, 28') legs of said second plurality (30) of laminations, second bias magnet means (36') establishing magnetic flux for polarizing said first (26, 26') and second (28, 28') legs of said third plurality (32) of laminations in opposite polarity to said first (26, 26') and second (28, 28') legs of said fourth plurality (34) of laminations, first winding means (38) looped between the first (26, 26') and second (28, 28') legs of said first plurality (24) of laminations for reinforcing the flux in axially aligned first legs (26, 26')

while opposing the flux in the other axially aligned second legs (28, 28') of said first plurality (24) of laminations and looped between the first (26, 26') and second (28, 28') legs of said second plurality (30) of laminations for reinforcing the flux in the axially aligned first legs (26, 26') while opposing the flux in the other axially aligned second leg (28, 28') of said second plurality (30) of laminations, and vice versa, depending upon the direction of electrical current flow in said first winding means (38), and second winding means (40) looped between said first (26, 26') and second (28, 28') legs of said third plurality (32) of laminations for reinforcing the flux in axially aligned first legs (26, 26') while opposing the flux in the other axially aligned second legs (28, 28') of said third plurality (32) of laminations and looped between said first (26, 26') and second (28, 28') legs of said fourth plurality (34) of laminations for reinforcing the flux in the axially aligned first legs (26, 26') while opposing the flux in the other axially aligned second legs (28, 28') of said fourth plurality (34) of laminations, and vice versa, depending upon the direction of electrical current flow in said second winding means (40) so that when said first (24) and second (30) plurality of laminations are axially aligned with and transversely overlying said magnetic zones (12) and said third (32) and fourth (34) plurality of laminations are axially offset p(n±¼) and transversely overlapping said magnetic (12) and nonmagnetic (14) zones, said long legs (28) of said second legs (28, 28') of each of said third (32) and fourth (34) plurality of laminations coact with the underlying magnetic zones (12) in response to current flow in said second winding means (40) in loop direction one (clockwise) to move said head (22) axially in one direction and said long legs (26') of said first legs (26, 26') of each of said third (32) and fourth (34) plurality of laminations coact with the underlying magnetic zones (12) in response to current flow in said second winding means (40) in loop direction two (counterclockwise opposite to direction one to move said head (22) axially in the opposite direction at which position current flow in said first winding means (38) in loop direction one causes said long legs (26') of said first legs (26, 26') of each of said first (24) and second (30) plurality of laminations to coact with the underlying magnetic zones (12) to move said head (22) axially in one direction or alternatively current flow in said first winding means (38) in loop direction two opposite to direction one causes said long legs (28) of said second legs (28, 28') of each of said first (24) and second (30) plurality of laminations to coact with the underlying magnetic zones (12) to move said head (22) axially in the opposite direction.

4,535,261

SMALLSIZE MOTOR WITH REDUCTION GEAR AND CLUTCH MECHANISM

Kou Tsukamoto, and Masatoshi Hirate, both of Kasugai, Japan, assignors to CKD Controls Limited, Kasugai, Japan

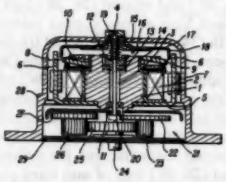
PCT No. PCT/JP82/00214, § 371 Date Feb. 3, 1983, § 102(e) Date Feb. 3, 1983

PCT Filed Jun. 1, 1982, Ser. No. 474,587

Claims priority, application Japan, Jun. 3, 1981, 56-85200; Aug. 13, 1981, 56-127096

Int. Cl.³ H02K *7/10*

U.S. Cl. 310—78 **1 Claim**



1. A combined small-size motor and speed reduction mechanism which comprises:

a motor having a cylindrical magnetic core with an axial hole therethrough and an excitation coil disposed therearound,

a yoke disposed adjacent a first end of said core having pole pieces extending axially along said core in spaced relation to the circumference of said coil,

a rotatable shaft mounted for rotation within said core and for axial movement with respect to said motor,

a main pole and an interpole mounted on said core adjacent to second end thereof,

an annular spring support means mounted on said rotatable shaft adjacent second end of said core, said spring support means having an axial annular recess,

an absorbing member of magnetic material affixed to an end of said rotatable shaft and having an axial annular recess in opposed relationship to the recess of said spring support means,

a coil spring extending between and having its ends disposed in the annular recesses of said spring support means and said absorbing member, said spring axially moving said rotatable shaft away from the first end of said core when said field is not excited,

a non-magnetic disk means extending radially outward from said absorbing member and having a hysteresis ring depending axially therefrom, said disk means having a diameter larger than the diameter of said interpole and main pole,

a gear means mounted on the second end of said rotatable shaft, and

a speed reduction means activatable by the axial movement of said shaft,

wherein when said coil is excited a magnetic closed loop circuit is formed through said core, said absorbing member, said main pole, said interpole, said hysteresis ring, said yoke, and said core causing axial movement of said rotating shaft to thereby activate said speed reduction means.

4,535,262

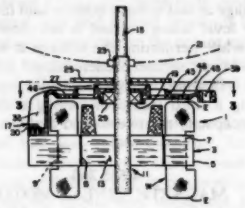
DYNAMOELECTRIC MACHINE HAVING MEANS FOR DRAINING WATER FROM ENDSHIELD

Barry M. Newberg, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 30, 1984, Ser. No. 646,808

Int. Cl.³ H02K *5/00*

U.S. Cl. 310—88 **5 Claims**



1. In a dynamoelectric machine comprising a stator having a stator core, with the latter having a central bore therethrough, said stator core having a plurality of slots extending generally radially outwardly from said bore, and a plurality of windings inserted in said slots and extending out beyond the end faces of said core, a rotor assembly including a rotor body received within said bore, and a rotor shaft rotatable with said rotor body, said dynamoelectric machine further comprising endshield means secured to said core for rotatably journalling said rotor shaft relative to said core, said dynamoelectric machine being normally disposed in its application with said rotor shaft in a generally vertical direction, and with said end shield facing generally upwardly, said endshield means having portions thereof extending out beyond said stator and said windings,

wherein the improvement comprises: means formed integral with said endshield means in the outer, upwardly facing surface thereof for channeling water generally radially outwardly away from said rotor shaft to said portions of said endshield means out beyond said stator and windings, and drain opening means in said portions of said endshield means out beyond said stator and windings, said drain means receiving water from said portions of said endshields and extending down below said endshields so as to permit the drainage of water away from said endshield means in a direction clear of said stator and said windings.

4,535,263

ELECTRIC D.C. MOTORS WITH A PLURALITY OF UNITS, EACH INCLUDING A PERMANENT MAGNET FIELD DEVICE AND A WOUND ARMATURE FOR PRODUCING POLES

Robert W. Avery, Blagdon, England, assignor to Fairey Hydraulics, Ltd., England

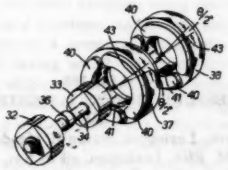
PCT No. PCT/GB82/00019, § 371 Date Sep. 13, 1982, § 102(e) Date Sep. 13, 1982, PCT Pub. No. WO82/02619, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 25, 1982, Ser. No. 422,903

Claims priority, application United Kingdom, Jan. 23, 1981, 8102022

Int. Cl.³ H02K *7/20, 37/00*

U.S. Cl. 310—112 **4 Claims**



1. An electric D.C. motor comprising two or more units each including a permanent magnet field device mounted to move angularly through a limited angle of rotation only relatively to a wound armature having coils for producing, when energized by a direct current, the same number of poles as the field, but located in a second number of equally spaced slots equal to an integral multiple of the number of poles, the wound armatures of all of said units being connected for simultaneous energization by a direct current in accordance with a demand signal, the units being mounted with the permanent field devices mechanically connected together in such relative position that the relative positions of the armature slots in relation to the poles of the permanent magnet field device of different motor units differs by an angle substantially equal to the slot pitch divided by the number of motor units so that their cogging torques substantially cancel out.

4,535,264

SLIP RING ASSEMBLY WITH INNER RECESS TO PREVENT SHORTING

Maurice J. Allport, Edgbaston, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

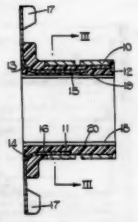
Filed Apr. 26, 1983, Ser. No. 488,660

Claims priority, application United Kingdom, May 6, 1982, 8213148

Int. Cl.³ H02K *39/08*

U.S. Cl. 310—232 **7 Claims**

1. A slip ring assembly for a rotary electric machine, comprising a body formed from electrically insulating material and having an external surface, at least one electrically conductive slip ring supported on said external surface of said body, and at least one electrically conductive connector element electrically connected to said at least one slip ring and extending axially of said body, said at least one connector element having a part which is disposed inwardly of said at least one slip ring and which is embedded in said body, said body having an internal bore which is adapted to receive a shaft of said rotary electric machine, the internal bore being provided with recess means for maintaining a positive clearance between said connector element and the shaft to prevent shorting of said connector element and the shaft, said recess means being defined in



the surface of said body adjacent to said internal bore and extending axially of said body for substantially the entire axial extent of said port along said body, said recess means being disposed radially inwardly of said part of said at least one connector element to be interadjacent thereto and interposed between said connector element and the shaft whereby the shaft is separated from said body adjacent to said part by said recess means.

4,535,265

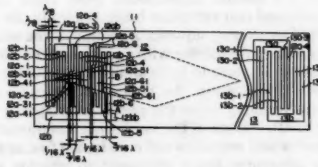
SURFACE ACOUSTIC WAVE TRANSDUCER WITH INTERNAL ACOUSTIC REFLECTION

Toshikazu Kodama, and Koji Sato, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 17, 1984, Ser. No. 611,544

Int. Cl.³ H03H *9/25*

U.S. Cl. 310—313 C **11 Claims**



1. A surface acoustic wave transducer comprising:

a piezoelectric substrate;

a first comb-shaped electrode formed on one surface of the piezoelectric substrate and having a plurality of parallel strips extending at right angles to the direction in which surface acoustic waves propagate; and

a second comb-shaped electrode formed on the piezoelectric substrate and having a plurality of parallel strips interdigitated with the strips of said first comb-shaped electrode, extending at right angles to the direction in which the waves propagate;

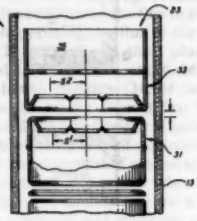
the parallel strips provided in at least one of said first and second comb-shaped electrodes having each a first portion which corresponds to said first portion and which only electrically reflects the waves and a second portion which both electrically and acoustically reflects the waves, and an effective length of said second portion being weighted in a propagation direction of a surface acoustic wave in a predetermined fashion.

4,535,266

IN-LINE ELECTRON GUN STRUCTURE FOR COLOR CATHODE RAY TUBE HAVING TAPERED WALLS AND ELONGATED APERTURES FOR BEAM SPOT-SHAPING

Donald L. Say, Waterloo, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed May 2, 1983, Ser. No. 490,639
Int. Cl.³ H01J *26/62*
U.S. Cl. 313—414 **9 Claims**



1. In an in-line electron gun structure for a color cathode ray tube, a lensing arrangement in the final focusing and accelerating electrodes comprising:

a first lensing structure in the forward portion of the focusing electrode, such structure having three in-line tapered apertures of substantially truncated volumetric configuration having substantially parallel axes of symmetry, each aperture having front beam exits and smaller dimensioned rear beam entrances, the front exits and rear entrances being generally circular and separated by sloping sidewalls, a portion of the sidewall of each aperture intersecting with a portion of the sidewall of an adjacent aperture to form an inwardly sloping arcuate rounded saddle along the region of intersection, such structure resulting from the partial overlapping of geometric constructions of the volumetric configurations; and

a second lensing structure in the rear portion of the final accelerating electrode in adjacent, facing relationship with the first structure, such second structure having three in-line tapered apertures of substantially truncated volumetric configuration having substantially parallel axes of symmetry, each aperture having rear beam entrances and smaller dimensioned front beam exits, the front exits and rear entrances being generally circular and separated by sloping sidwalls, a portion of the sidewall of each aperture intersecting with a portion of the sidewall of an adjacent aperture to form an inwardly sloping arcuate rounded saddle along the region of intersection, such structure resulting from the partial overlapping of geometric constructions of the volumetric configurations,

at least one of said entrances and exits in said first and second lensing structures being elongated to provide electron beam spot-shaping, elongation in the first structure being normal to the in-line plane and elongation in the second structure being in the direction of the in-line plane.

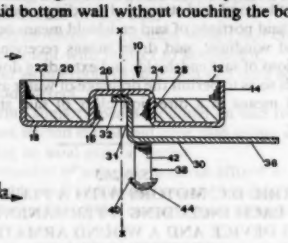
4,535,267

GETTER ASSEMBLY WITH IMPROVED SUPPORT

Daniele Martelli, and Giuseppe Lani, both of Milan, Italy, assignors to SAES Getters S.p.A., Milan, Italy

Filed Nov. 7, 1983, Ser. No. 549,406
Claims priority, application Italy, Nov. 11, 1982, 24192 A/82
Int. Cl.³ H01J *29/94*
U.S. Cl. 313—481 **7 Claims**

1. A getter assembly for a cathode ray tube comprising an annular getter material container having an outer side wall, an inner side wall and a bottom wall joining said outer side wall to said inner side wall so defining an annular channel which contains powdered getter material the top of said inner side wall being integrally formed round a disc shaped member to form an upraised bottom portion, a tab member is affixed centrally of said disc shaped member by means of a horizontal welding zone and further comprises a downwardly dependent zone which is distanced away from said inner side wall and an outwardly extending zone situated in a plane substantially parallel to said bottom wall without touching the bottom wall



and extending to a distance greater than the radius of the outer wall and a support means attached to said tab member said support means having at least two concave surfaces facing said bottom wall and lying in a plane perpendicular to the outwardly extending zone of the tab member.

4,535,268

HIGH PRESSURE TIPLESS TUNGSTEN HALOGEN LAMP

Merle E. Morris, Lexington; Steven L. Meade, Winchester, and Lawrence M. Rice, Lexington, all of Ky., assignors to GTE Products Corporation, Danvers, Mass.

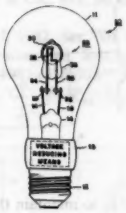
Filed Mar. 30, 1983, Ser. No. 480,530
Int. Cl.³ H01K *1/28, 1/50, 3/22, 3/26*
U.S. Cl. 313—569 **24 Claims**

1. In a tungsten halogen lamp including a tubular envelope of vitreous material containing a combined atmosphere therein and having substantially regular and smooth outer surfaces and first and second, opposed sealed end portions, and a coiled tungsten filament located within said envelope, the improvement wherein said combined atmosphere is established at high pressure greater than one atmosphere and comprises a gas misture and nitrogen, said gas mixture including an inert gas and a halogen compound formed by gasification of a pool of liquified gas sealed within said envelope, said nitrogen being present within said envelope at a pressure of one atmosphere by flowing said nitrogen established at a pressure of one atmosphere into an open end of said envelope immediately prior to sealing thereof, said tubular envelope not including a protruding, residual tip or the like thereon.

4,535,269
INCANDESCENT LAMP

Charles D. Tschetter, Mayfield Village, and Rolf S. Bergman, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,164
Int. Cl.[3] H01J 5/02; H01K 1/32
U.S. Cl. 313—579 4 Claims



1. An efficacy improved general service incandescent lamp comprising:

(a) a housing having an electrically conductive base;

(b) an outer envelope attached to said housing;

(c) an inner envelope having an outer surface of revolution which is substantially ellipsoidal with internally located related foci, said inner envelope being spatially supported within said outer envelope, containing a halogen gas along with a fill-gas at a pressure significantly above atmospheric, and having an IR reflective film covering the substantially ellipsoidal outer surface thereof,

(d) a filament adapted to be effectively energizable for normal operating wattage rating at a reduced voltage relative to a typical household power source, said filament being spatially predetermined within said inner envelope, located longitudinally along the major axis of the inner envelope, and its lighted length fully occupying the distance between the foci of the inner envelope;

whereby during the operation of said lamp said film substantially transmits visible radiation and substantially reflects toward said filament infrared radiation emitted by said filament, said film being capable of such transmission and reflection for temperatures approaching the softening point of the material of the inner envelope.

4,535,270
RESONANT DEGAUSSING WITHOUT RESIDUAL MAGNETISM

Keith R. Frantz, Myerstown; Robert A. Barnes, Bainbridge, and Bruce G. Marks, Lancaster, all of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 17, 1983, Ser. No. 553,007
Int. Cl.[3] H01J 29/06
U.S. Cl. 315—8.0 5 Claims

1. A degaussing circuit for a cathode ray tube of a video display apparatus incorporating means for providing field and line rate deflection currents during a field and line deflection interval through a deflection yoke disposed on said cathode ray tube, said degaussing circuit comprising:

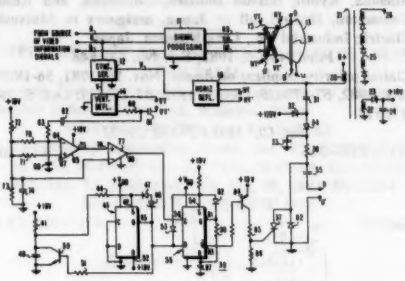
a source of voltage;

a capacitor charged from said source of voltage;

a degaussing coil disposed about said cathode ray tube;

means providing an output signal as an indication of substantially zero deflection current; and

switch means responsive to said output signal for coupling said capacitor to said degaussing coils for providing a decaying alternating current flow in said degaussing coil,

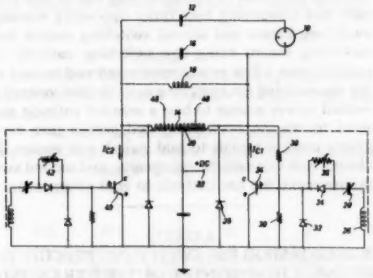


said alternating current decaying substantially to zero during a fraction of said field deflection interval.

4,535,271
HIGH FREQUENCY CIRCUIT FOR OPERATING A HIGH-INTENSITY, GASEOUS DISCHARGE LAMP

Kenneth P. Holmes, Houston, Tex., assignor to Wide-Lite International, San Marcos, Tex.

Continuation of Ser. No. 700,222, Jul. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 654,926, Feb. 2, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 899,479
Int. Cl.[3] H05B 37/02, 39/04, 41/36
U.S. Cl. 315—209 R 19 Claims



1. A circuit for operating a high frequency, gaseous discharge lamp, comprising

a push-pull, Class C oscillator having a resonant circuit including a high-Q coil connected to a first operating electrode of the lamp, said oscillator being connected to a power source, said resonant circuit establishing an operating frequency in the range between approximately 60 kHz and 100 kHz,

a ballast impedance connected to a second operating electrode of the lamp, and

said high-Q coil in said resonant circuit providing the lamp with high power and high frequency current.

4,535,272
IMAGE DISPLAY APPARATUS

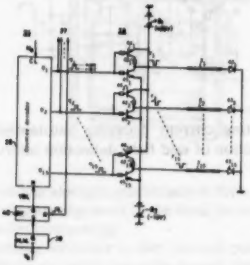
Minoru Ueda, Takatsuki; Sadahiro Iyehara, Suita; Mitsuya Masuda, Kyoto; Shizuo Inohara, Toyonaka, and Keisuke Yamamoto, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 5, 1982, Ser. No. 439,548

Claims priority, application Japan, Nov. 16, 1981, 56-183555; Oct. 1, 1982, 57-173425; Oct. 5, 1982, 57-175517; Oct. 5, 1982, 57-175518

Int. Cl.³ H01J *29/70, 29/72*

U.S. Cl. 315—366 **17 Claims**



1. An image display apparatus comprising:

a phosphor screen,

an electron beam source having a first predetermined number of line cathode for in turn emitting said first predetermined number of horizontal rows of electron beams, each row having a second predetermined number of rod shaped electron beams,

horizontal deflection means for horizontal deflections of said electron beams,

vertical deflection means for vertical deflections of said electron beams of the horizontal rows and electron beams for controlling said electron beams,

characterized by further comprising,

switch pair means of said first predetermined number, each switch pair means being for controlling heatings and electron emissions of corresponding one of said line cathodes and comprising each other oppositely working first switching means and second switching means, said first switching means being for switching cathode heating current from a first power source and said second switching means being for switching cathode bias voltage from a second power source to bias a selected cathode and

control means for controlling said switch pair means by giving control signals to said switch pair means thereby closing said first switch and opening said second switch to in turn make the line cathode to emit electrons.

4,535,273
TRANSFORMERLESS SWITCHING CIRCUIT FOR DRIVING A HORIZONTAL OUTPUT TRANSISTOR

Richard W. Midland, Inverness, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation of Ser. No. 312,583, Oct. 19, 1981, abandoned. This application Aug. 17, 1984, Ser. No. 641,633

Int. Cl.³ H01J *29/70, 29/76*

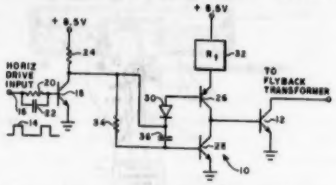
U.S. Cl. 315—401 **6 Claims**

1. A transformerless, temperature compensated switching circuit for turning a horizontal output transistor off and on in response to horizontal rate input pulses, comprising:

a first transistor responsive to the input pulses for alternately switching from a conductive state to a non-conductive state;

a second transistor having a collector-emitter circuit coupled to the horizontal output transistor and being responsive to the conductive state of the first transistor for supplying base current from said collector-emitter circuit to the horizontal output transistor;

temperature compensating means coupled to the collector-emitter circuit of the second transistor for varying the gain thereof and thereby the amplitude of the base current supplied to the horizontal output transistor as a function



of temperature so as to maintain the saturation current of the latter transistor substantially constant as its current gain changes with variations in temperature; and

a third transistor coupled to the horizontal output transistor and responsive to the non-conductive state of the first transistor for providing a low impedance current discharge path at the base of the horizontal output transistor for rapidly turning off the latter transistor.

4,535,274
DRIVING CIRCUIT FOR BRUSHLESS D.C. MOTOR

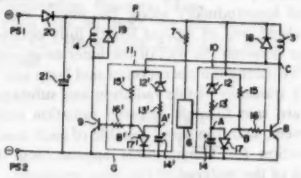
Isamu Suzuki, Funabashi, and Yoshio Hattori, Zushi, both of Japan, assignors to Toyo Electric Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 630,961

Claims priority, application Japan, Jul. 20, 1983, 58-130864; Sep. 2, 1983, 58-160486

Int. Cl.³ H02P *6/02*

U.S. Cl. 318—254 **13 Claims**



13. A driving circuit for a brushless motor which is adapted to supply exciting current to exciting windings of said motor from a power supply in turn to rotate a permanent-magnetic rotor, comprising:

a rotor position detecting means for detecting the position of said rotor;

transistors connected in series to said exciting windings and adapted to allow exciting current to flow to said exciting windings when they are rendered conductive, respectively; and

transistor control circuits provided with respect to said transistors to control said transistors depending upon the output of said rotor position detecting means;

said transistor control circuits each comprising:

a series circuit comprising first and second resistors and provided between the base of said transistor and one of the outputs of said power supply to allow current to be supplied to said base of said transistor;

a series circuit comprising a Zener diode, a third resistor and a capacitor connected in series together and provided between both outputs of said power supply, said Zener diode having a Zener level selected to exceed the starting voltage of said motor; and

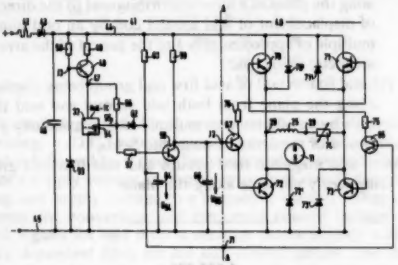
a PUT of which the anode-cathode circuit is connected in

parallel to both ends of said capacitor and the gate is connected to the connection between said first and second resistors.

4,535,275
BRUSHLESS D-C MOTOR SYSTEM WITH IMPROVED COMMUTATION CIRCUIT

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co., KG, St. Georgen, Fed. Rep. of Germany

Filed Dec. 7, 1982, Ser. No. 447,688
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1981, 3150922; Dec. 23, 1981, 3150923
Int. Cl.³ H02P *6/02*
U.S. Cl. 318—254 **33 Claims**

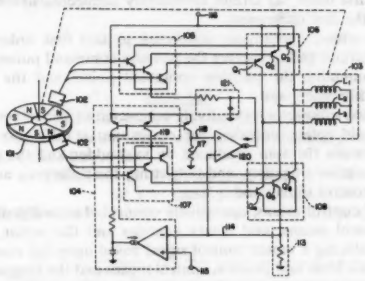


1. Brushless d-c motor system having
a stator having at least one winding;
a permanent magnet rotor in magnetic inductive position with respect to the stator;
means for sensing rotor position and for deriving a signal representative of the position of the rotor with respect to the stator;
power supply buses for connection to a direct current source;
a four transistor bridge circuit having four transistors arranged as two bridge-halves, of which each half includes two of the four transistors, and carries current through the winding in a respective one of two opposite directions,
said four transistor bridge circuit forming a full bridge, and being connected to the terminals of said winding,
said full bridge circuit being further connected to and controlled by the rotor position sensing means;
two capacitance means;
first and second voltage changing means, connected to the capacitance means for changing the voltage on the associated capacitance means, each bridge-half including a respective capacitance means,
one of said voltage changing means forming a capacitance charging means and the other of said voltage changing means forming a capacitance discharge means;
each of said capacitance means being connected to the respective bridge-half such that the voltage of the capacitance means determines the degree of conductivity of at least one of the two transistors of the respective bridge-half;
the change of voltage on the capacitance means, effected by the associated first voltage changing means causing the respective bridge-half to become conductive, and the change in the voltage on the capacitance means effected by the associated second voltage changing means causing the respective bridge-half to become non-conductive or to block;
and wherein the transistors of the four transistor bridge circuit, the capacitance means, and the first and second voltage changing means are so dimensioned relative to each other that the voltage change effected by each of the first voltage changing means is slower than that effected by the second voltage changing means, to produce a time gap between switching OFF of one bridge-half and subsequent switching ON of the other bridge-half.

4,535,276
OUTPUT CIRCUIT AND BRUSHLESS MOTOR USING THE SAME

Nobuyoshi Yokobori, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jan. 10, 1984, Ser. No. 569,762
Claims priority, application Japan, Jan. 12, 1983, 58-3675; Jan. 24, 1983, 58-10405; Jan. 25, 1983, 58-10698; Jan. 26, 1983, 58-11858; Jan. 27, 1983, 58-12318; Jan. 28, 1983, 58-13054
Int. Cl.³ H02P *6/02*; G05F *1/56*
U.S. Cl. 318—254 **9 Claims**

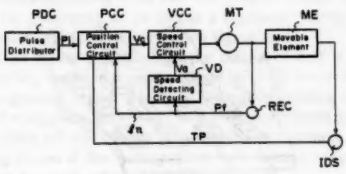


1. An output circuit comprising: a voltage control means connected to one end of a load; a current control transistor connected to the other end of said load; first current detecting means for detecting the emitter current of said current control transistor; a first amplifier for amplifying an error between an output signal of said first current detecting means and a current command signal; a distributor for distributing the output of said first amplifier to the base of said current control transistor and a second current detecting means; a second amplifier for amplifying a difference between the output signals of said first and second current detecting means, whereby the output of said second amplifier controls said voltage control means.

4,535,277
POSITION CONTROL APPARATUS AND METHOD

Mitsuo Kurakake, Hino, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

Filed Apr. 13, 1983, Ser. No. 484,537
Claims priority, application Japan, Apr. 16, 1982, 57-63309
Int. Cl.³ G05B *13/00*
U.S. Cl. 318—561 **5 Claims**



1. A position control apparatus of a closed-loop configuration for controlling the position of a movable machine element driven by a motor having a shaft and receiving position command pulses, comprising:
a position detector provided on the movable machine element for detecting the position thereof, said position de-

tector producing a position signal indicative of the detected position;

a rotary encoder provided on the motor shaft for detecting the rotational speed of the motor, said rotary encoder generating pulses of a number proportional to the detected rotational speed, the total number of said pulses representing the position of the motor and the frequency thereof representing the actual speed of the motor;

position control means, operatively connected to said position detector and said rotary encoder, for producing a control signal based upon the position signal from said position detector and the total number of pulses from said rotary encoder, said position control means comprising:

an arithmetic unit, operatively connected to said rotary encoder and said position detector, for computing a first difference between the position signal and the total number of pulses;

a first order lag circuit operatively connected to receive the first difference;

an adder, operatively connected to said first order lag circuit and to receive the position command pulses, for summing the position command pulses and the first difference; and

a first subtractor, operatively connected to said adder and said rotary encoder, for computing a difference between the sum produced by said adder and the total number of pulses, and outputting the difference as the control signal; and

speed control means, operatively connected to said position control means, said rotary encoder and the motor, for producing a motor control signal based upon the control signal from said position control means and the frequency of the pulses from said rotary encoder, the motor being driven by said motor control signal to control the position of the movable machine element, said speed control means comprising:

a frequency converter, operatively connected to said rotary encoder, for converting the frequency into an actual speed signal; and

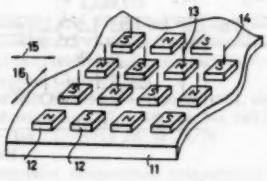
a second subtractor, operatively connected to said first subtractor, said frequency converter and the motor, for computing the difference between the control signal and the actual speed signal and producing the motor control signal.

4,535,278

TWO-DIMENSIONAL PRECISE POSITIONING DEVICE FOR USE IN A SEMICONDUCTOR MANUFACTURING APPARATUS

Teruo Asakawa, Nirasaki, Japan, assignor to Telmec Co., Ltd., Nirasaki, Japan

Filed Apr. 1, 1983, Ser. No. 481,324
Claims priority, application Japan, Apr. 5, 1982, 57-56344
Int. Cl.³ G05B *11/00*
U.S. Cl. 318—687 **18 Claims**



1. A two-dimensional current-motion converter comprising:

a magnetic field group formed from a plurality of magnetic fields disposed on a plane in a two-dimensional array, the centers of the magnetic fields of the array being separated by an equal period, the magnetic fields of the array being disposed perpendicular to the plane andadjacent magnetic fields being directed in alternate directions; and

a first coil group comprising at least first, second, third and fourth coils having a fixed dimensional relationship:

(i) each coil of said first coil group being provided with an outer dimension approximately equal to 3/2 of the period of the array of magnetic fields;

(ii) each coil of said first coil group being provided with a winding width approximately equal to ½ of the period of the array of magnetic fields;

(iii) said second coil of said first coil group being displaced along the plane from said first coil by an odd number multiple of approximately ½ of the period of the array of magnetic fields;

(iv) said third coil of said first coil group being displaced aong the plane in a direction orthogonal to the direction of displacement of said second coil by an odd number multiple of approximately ½ of the period of the array of magnetic fields; and

(v) said fourth coil of said first coil group being displaced along the plane from both said second and said third coils by an odd number multiple of approximately ½ the period of the array of magnetic fields;

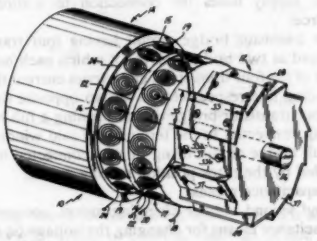
one of said magnetic field groups and said first coil group being freely movabie along the plane.

4,535,279

IMPULSE MOTOR STRUCTURE, DRIVE SYSTEM AND CONTROL CIRCUIT

Dominic Arbisi, 13001 Berkshire Dr., Minnetonka, Minn. 55343, and Roger E. Mitchell, 3710 Vincent Ave. South, Minneapolis, Minn. 55410

Filed Aug. 1, 1983, Ser. No. 519,203
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **18 Claims**



16. An impulse motor comprising:

a stator of cylindrical shape positioned about a rotational axis and containing a plurality of primary drive coils circumferentially arranged around the stator in a first track, each primary drive coil of the first track being oriented to produce a magnetic field in a radial direction when energized; and

a rotor positioned for rotation about the rotational axis and containing a plurality of electrically conductive elements circumferentially arranged around the rotor; each electrically conductive element being oriented parallel to the rotational axis and tilted with respect to a plane orthogonal to a radial axis, the primary drive coils when energized inducing circulating currents in the conductive elements thereby creating opposing forces between the conductive elements and the primary drive coils, a sum of the opposing forces including a circumferential component which causes rotational motion of the rotor; and

means for periodically energizing the coils of the first track.

4,535,280

STABILIZING CIRCUIT FOR AN INVERSE RECTIFIER MOTOR CONTROL

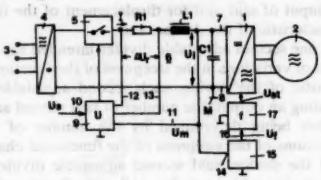
Nils-Ole Harvest, and Anna Melamed, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Mar. 28, 1984, Ser. No. 594,300

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313124

Int. Cl.³ H02P 5/40

U.S. Cl. 318—798 10 Claims



1. A stabilizing circuit for an inverse rectifier motor control, comprising, a D.C. voltage supply having a D.C. voltage regulator followed by a smoothing intermediate circuit which outputs a supply voltage, a frequency control circuit for converting said supply voltage to a frequency control voltage, a generator for converting said frequency control voltage to control signals for said inverse rectifier motor control, a frequency dependent filter for for said control circuit, said frequency control circuit including longitudinal branch means having a main resistor and a shunt connection of two series connected resistors, said frequency control circuit including transverse branch means having parallel diode and resistor means and a capacitor connected in series therewith, said capacitor being connected between said series connected resistors, said longitudinal and transverse branches being responsive to an increased frequency of the A.C. voltage components of said supply voltage and being operable to charge said capacitor at a slower rate than the discharge thereof so that the output of said frequency control circuit is a summation of said supply voltage and the voltage of said capacitor to effect (1) an increase of the mean value of said frequency control voltage relative to the mean value of said supply voltage and (2) a reduction of the amplitude of the A.C. voltage component of said frequency control voltage relative to said A.C. voltage component of said supply voltage.

4,535,281

AUTOMATIC VOLTAGE REGULATING SYSTEM FOR ELECTRIC GENERATOR

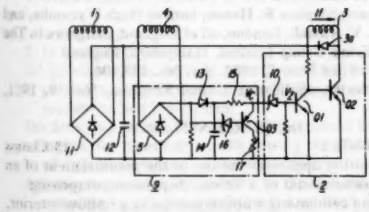
Motohiro Shimizu, Asaka, and Shigeru Fujii, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1983, Ser. No. 550,673

Claims priority, application Japan, Nov. 10, 1982, 57/197139

Int. Cl.³ H02P 9/30, 9/14

U.S. Cl. 322—28 18 Claims



1. An automatic voltage regulating system for an electric generator comprising a detection coil for detecting the output voltage of an AC generator; said generator having a field coil and an exciting coil for supplying a field current to said field coil; a detection circuit means for rectifying and smoothing the output voltage of the detection coil to form a pulse voltage therefrom; and a control circuit means coupled to said detection circuit means, for comparing the pulse voltage to a predetermined voltage and for controlling the supply of field current to said field coil as a function of the comparison; said detection circuit means including a rectifying circuit means for rectifying the output voltage of said detection coil, a smoothing circuit means, coupled thereto, for smoothing the output voltage, and regulating circuit means coupled to the output of said smoothing circuit means for shifting the voltage level thereof, wherein said regulating circuit means shifts the level of the voltage in said smoothing circuit means by comparing the voltage in said rectifying circuit means with the predetermined voltage to control the field current during the period of the shifting of the voltage level.

4,535,282

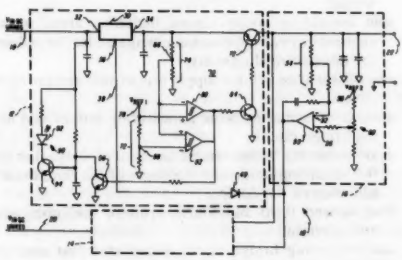
VOLTAGE REGULATION CIRCUIT

Chien Nguyen, Davie, Fla., assignor to Stromberg-Carlson Corp., Lake Mary, Fla.

Filed Dec. 14, 1983, Ser. No. 560,881

Int. Cl.³ G05F 1/58

U.S. Cl. 323—269 14 Claims



1. A circuit for supplying power at a regulated voltage level to an external circuit comprising:

(A) a plurality of power circuit means each for supplying power to the external circuit, each of said power circuit means having an input terminal for connection to an unregulated power supply and having an output terminal, with all of the output terminals being connected together for connection to the external circuit, each said power circuit means further having:

(i) voltage regulating means connected to said input terminal for receiving power from said unregulated power supply and for generating at an output a regulated voltage at a level determined by a correction signal; and

(ii) switch means connected to the output of said voltage regulating means and to said output terminal for receiving the regulated output from said voltage regulating means and for coupling the voltage to the external circuit and for switching off the voltage provided by said voltage regulating means if the voltage from said voltage regulating means is outside of a selected range; and

(B) correction signal generating means connected to the output terminals of all of said power circuit means and to all of said voltage regulating means for generating the correction signal and for coupling it to all of said voltage regulating means in response to variations in the regulated voltage at said output terminals to maintain the voltage supplied to the external circuit at a selected level.

4,535,283

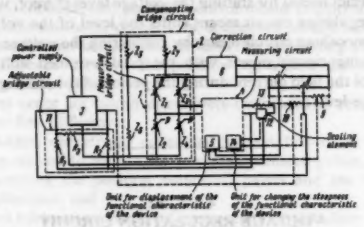
DEVICE FOR CONVERSION OF NON-ELECTRICAL QUANTITY INTO ELECTRICAL SIGNAL

Lev M. Rabinovich; Albert Y. Jurovsky; Jury M. Brodkin; Viktor A. Puginsky; Georgy G. Iordan; Vilen I. Serdjukov; Vadim K. Sukhodolets; Galina V. Tikhnova, and Galina M. Golikova, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Nauchno-Issledovatelsky Institut Teploenergeticheskogo Priborostroenia, Moscow, U.S.S.R.

Filed Apr. 18, 1983, Ser. No. 485,631

Int. Cl.³ H03H 9/02

U.S. Cl. 323—365 **6 Claims**


Compensating bridge circuit
Correction circuit
Measuring circuit
Controlled power supply
Measuring bridge circuit
Adjustable bridge circuit
Scaling element
Unit for displacement of the functional characteristic of the device
Unit for changing the steepness of the functional characteristic of the device

1. A device for conversion of a nonelectrical quantity into an electrical signal comprising:

a measuring bridge circuit for forming an electrical signal corresponding to the nonelectrical quantity being converted;

said measuring bridge circuit including arms, which are elements whose impedances change under the influence of the nonelectrical quantity;

one of said arms being a supply arm of said measuring bridge circuit;

another of said arms being a measuring arm of said measuring bridge circuit;

a compensating bridge circuit for forming a signal to correct the initial amplitude and steepness of the functional characteristic of the device;

first, second third and fourth arms of said compensating bridge circuit;

said measuring bridge circuit being said first arm of said compensating bridge circuit;

said other arms of said compensating bridge circuit being elements whose impedances are not functions of said nonelectrical quantity being converted;

one of said other arms being a supply arm of said compensating bridge circuit;

another of said other arms being a measuring arm of said compensating bridge circuit;

a controlled power supply providing passage of current through said elements of said measuring and compensating bridge circuits and including control inputs;

said supply or arms of said measuring and compensating bridge circuits, connected to said controlled power supply;

a measuring circuit for measuring the level of the electrical signal and including an input and an output;

a load forming an output circuit connected to said output of said measuring circuit;

a unit for displacement of the functional characteristic of the device of said measuring circuit for regulation of the initial amplitude of the output signal of the device, said unit including a control output;

said measuring arm of said measuring bridge circuit, being connected to said input of said measuring circuit;

a circuit for scaling the functional characteristic of the device;

a correction circuit for conversion of the signal taken from said measuring arm of said compensating bridge circuit into a control signal for said unit for displacement of the functional characteristic of the device and for the circuit for scaling the functional characteristic of the device, said correction circuit including an input and differential outputs;

said measuring arm of said compensating bridge circuit, connected to said input of said correction circuit;

at least one first adjustable divider intended for compensation of variations of the initial value of the functional characteristic of the device, the number of said correction circuits being determined by the number of required corrections of the initial value of the functional characteristic of the device, said correction circuits being connected to said input of said unit for displacement of the functional characteristic of the device; and

at least one second adjustable divider intended for compensation of variations in the steepness of the functional characteristic of the device, each second adjustable divider including an output, the number of said second adjustable dividers being determined by the number of required corrections of the steepness of the functional characteristic of the device, said second adjustable dividers being connected to said circuit for scaling the functional characteristic of the device.

4,535,284

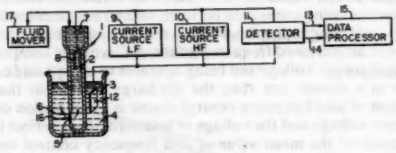
HIGH AND LOW FREQUENCY ANALYSIS OF OSMOTIC STRESS OF CELLS

Michael R. Groves, and Carlos M. Rodriguez, both of Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jul. 10, 1981, Ser. No. 282,293

Int. Cl.³ G01N 27/00

U.S. Cl. 324—71.1 **19 Claims**



1. In a method wherein osmotic activity of biological cells is induced by an osmotic or lytic shock and is monitored in a particle analyzer having an aperture for electronic particle volume sensing, the improvement comprising the steps of:

passing a high frequency current through said aperture to generate a detectable high frequency signal for each cell passing therethrough;

detecting said high frequency signals;

classifying the cells into subpopulations, representative of the state of osmotic activity of each cell, by their said high frequency signals.

4,535,285

APPARATUS FOR DETERMINING AN ELECTRICAL CHARACTERISTIC OF A FIBROUS DISPERSION

Brian E. Evans; Stephen R. Hemm, both of High Wycombe, and Rupert A. V. Russell, London, all of England, assignors to The Wiggins Teape Group Limited, Hampshire, England

Filed Nov. 5, 1982, Ser. No. 439,406

Claims priority, application United Kingdom, Nov. 9, 1981, 8133786

Int. Cl.³ G01N 27/00

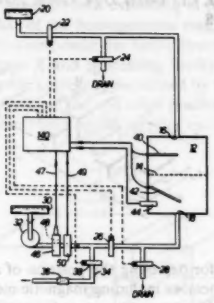
U.S. Cl. 324—71.1 **23 Claims**

1. A measuring apparatus for use in the measurement of an electrical characteristic of a fibrous dispersion comprising:

a measuring cell having a housing defining a hollow interior, upper and lower ports in said housing to allow fluid to be passed therethrough in a generally vertical direction, and an essentially horizontally disposed filter mesh in said

housing dividing said interior hollow into upper and lower compartments, and a respective electrode in each of said compartments for measuring the streaming potential generated in the cell; and

respective first and second fluid conduit arrangements connected to said upper and lower ports respectively, the first conduit arrangement including respective connections for a source of flushing fluid and drain and valve means for



controlling the flow of fluid through said connections, and the second conduit arrangement including respective connections for a source of particle-bearing stock and drain, and valve means for controlling the flow of fluid through these last mentioned connections, whereby stock enters the cell to build a pad of particles on the underside of the filter mesh and the pad is subsequently flushed from the filter mesh to drain through said lower port.

4,535,286

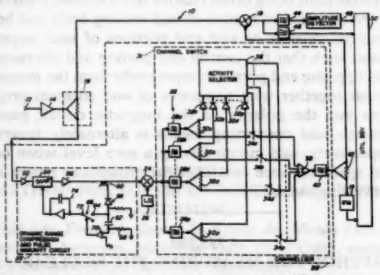
RADIO FREQUENCY RECEIVER

William B. Sullivan, Jr., Verona, N.J., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 90,811, Nov. 2, 1979, Pat. No. 4,363,139. This application Sep. 24, 1982, Ser. No. 423,411

Int. Cl.³ G01R *23/14*

U.S. Cl. 324—79 R **6 Claims**



1. In combination:

(a) passing means, having a predetermined bandwidth, for passing signals in a plurality of different portions of the predetermined bandwidth;

(b) detecting means, fed by the signals passed by the passing means, for detecting signals passing through the plurality of different portions of the predetermined bandwidth;

(c) coupling means, responsive to the detected signals, for coupling signals passing through a selected portion of the different portions of the predetermined bandwidth of the passing means to a common output while decoupling signals passing through the remaining different portions of the predetermined bandwidth of the passing means from the common output; and

(d) a frequency measuring means, responsive to signals having frequencies in the predetermined bandwidth, for determining the frequency of signals passing through the coupling means to the common output and having a frequency within the selected portion of the different portions of the predetermined bandwidth.

4,535,287

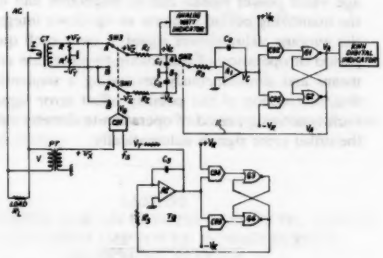
ELECTRONIC WATT/WATTHOUR METER WITH AUTOMATIC ERROR CORRECTION AND HIGH FREQUENCY DIGITAL OUTPUT

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed Mar. 25, 1983, Ser. No. 478,717

Int. Cl.³ G01R *21/06, 1/02*

U.S. Cl. 324—142 **13 Claims**



1. An improved electronic watt/watthour meter circuit having analog and high frequency digital outputs with automatic error correction comprising:

first transformer means having a primary winding for connection to a source of electric energy for excitation in response to either the electric current or the electric voltage supplied from the source of electric energy and a secondary winding for providing a first signal proportional thereto;

second transformer means having a primary winding for connection to the source of electric energy for excitation in response to the other of the electric current or electric voltage supplied from the source of electric energy and a secondary winding for providing a second signal proportional thereto;

multiplier circuit means for receiving and multiplying said first and second signals together and deriving an output product signal representative of instantaneous power being supplied by the source of electric energy;

said multiplier circuit means comprising comparator means for receiving said first signal and a sampling signal from a sampling signal source and deriving a pulse width modulated switching signal, and a multiplier switching circuit means responsive to and controlled by said pulse width modulated switching signal and having the second signal supplied to an output thereof for providing at its output a pulse width modulated and amplitude modulated product signal of the first and second signals and representative of the instantaneous power being supplied by the source of electric energy;

multiplier low pass filter circuit means coupled to the output from said multiplier circuit means for deriving from the pulse width modulated and amplitude modulated product signal an average value power signal V where $V = VI \cos \theta$ where V is the load voltage, I is the load current and θ is the load impedance phase angle;

analog-to-pulse rate converter means responsive to the average value power signal V from said multiplier low pass filter circuit means for summing and integrating the aver-

age value power signal V and converting it into a high frequency train of output signal pulses wherein each output signal pulse represents a predetermined quantized amount of electric energy;

automatic offset error correction circuit means responsive to the output from said analog-to-pulse rate converter means for automatic addition/subtraction averaging of system offset error signals during each quantizing period of operation of the analog-to-pulse rate converter means, said automatic offset error correction circuit means comprising polarity reversing switching means coupled intermediate the output from the multiplier low pass filter circuit means and the input to the analog-to-pulse rate converter means, the polarity reversing switching means being responsive to the output from the analog-to-pulse rate converter means for automatically switching the polarity of the average value power signal V supplied to the input of the analog-to-pulse rate converter means midway through the quantizing period for supplying unlike polarity average value power signals during respective half cycles of the quantizing period to cause an up/down integration of the average value power signal V over each quantizing period of operation of the analog-to-pulse rate converter means and simultaneously producing a sequential addition/subtraction of like polarity offset error signals over each quantizing period of operation to thereby cancel out the offset error signals automatically.

4,535,288

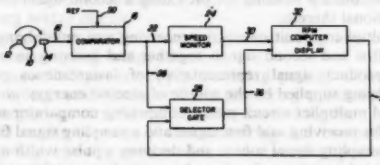
METHOD AND SYSTEM FOR ROTARY SPEED DETERMINATION

Joseph L. Vitulli, Jr., New Rochelle, N.Y., assignor to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Filed Jul. 19, 1982, Ser. No. 399,320

Int. Cl.³ G01P *3/56*

U.S. Cl. 324—161 **13 Claims**



13. In combination, for determining the rotational speed of a body having a sensible indicium rotatable therewith, comprising:

(a) transducer means for sensing each revolution of said indicium and generating an output signal indicative of each such sensing;

(b) selector means for receiving each such means (a) output signal and responsive to a control signal for gating selective but not all of such received means (a) output signals therethrough;

(c) means for generating said control signals for such selective gating and for applying same to said means (b); and

(d) means for receiving such signals gated selectively through said means (b) for determining body rotational speed therefrom.

4,535,289

DEVICE FOR MEASURING A POSITION OF A MOVING OBJECT

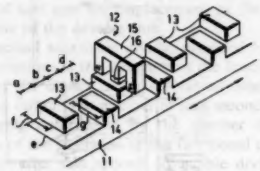
Kunihiro Abe, Higashimurayama, and Yoshihiko Morimoto, Hachioji, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1982, Ser. No. 377,640

Claims priority, application Japan, May 15, 1981, 56-73757

Int. Cl.³ G01B *7/14*; G01R *33/06*

U.S. Cl. 324—208 **11 Claims**



1. In a device for detecting the position of a moving body, having a sensor member including magnetic means for producing a magnetic field, converting means for converting variation of magnetic flux density of said magnetic field to variation of voltage, and a detected member made of magnetic material and one of said members being secured to said moving body such that said members undergo relative movement, said magnetic means and said detected member being disposed to form a magnetic circuit passing through said converting means, the improvement wherein

said detected member includes a plurality of projections arranged one after the other substantially in a direction of motion of said moving body with a space between adjacent of said projections, said spaces being one after the other substantially in said direction of motion of said moving body,

said magnetic means including a central end portion and two opposite end portions arranged transverse to the direction of motion of said moving body, said opposite end portions being magnetized in opposite polarity,

said converting means being provided on said central end portion,

said projections being offset relative to each other transverse to the direction of motion of said moving body and being arranged relative to said end portions of said magnetic means such that the central end portion and alternate of said opposite end portions respectively form the magnetic circuit together with respective of said adjacent projections and the polarity of the magnetic circuit passing through said converting means is alternately inverted, respectively, said circuit having a zero level when each said space between said adjacent projections passes said converting means.

4,535,290

METHOD FOR MEASURING THE NUCLEAR MAGNETIC RESONANCE FOR NMR TOMOGRAPHY

Hans Post, Schriesheim, and Dieter Ratzel, Rheinstetten, both of Fed. Rep. of Germany, assignors to Bruker Medizintechnik GmbH, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,699

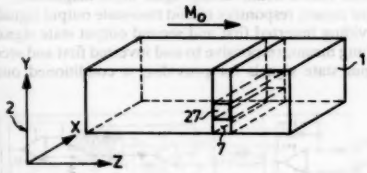
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1982, 3209264

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **10 Claims**

1. A method useful in NMR tomography for measuring the nuclear magnetic resonance in selected areas of a body for the purpose of representing body cross-sections in the form of images comprising the steps of subjecting the body to a homogeneous static magnetic field M_O and superimposing upon the said homogeneous magnetic field a first magnetic field gradient

G_Z of identical orientation whose strength varies in the direction of a first space coordinate Z of the body, selectively exciting thereafter selected nuclear spins contained in the body in a selected X-Y plane extending perpendicular to the direction of the first space coordinate Z and defined by the Larmor frequency of the selected nuclear spins in the magnetic field resulting from the superimposition of the said homogeneous magnetic field and the said first gradient field G_Z, applying thereafter another gradient field exhibiting in turn an orientation identical to that of the homogeneous magnetic field and varying in a direction perpendicular to the direction of the said first space coordinate Z and processing finally the induction signals supplied by the nuclear spins excited by the said homogeneous magnetic field and the said other gradient field to form image signals, characterized by the steps of exciting, when the



first gradient field G_Z is applied, the entirety of the selected nuclear spins present within the homogeneous magnetic field M_O and effecting the selective excitation of the nuclear spins located in the selected X-Y body plane a manner causing the selected nuclear spins located in the said X-Y plane to be shifted back into the direction of the homogeneous magnetic field M_O so that their orientation is identical with or, alternatively, opposite to that of the homogeneous magnetic field, effecting after application of the gradient field G_X a repeated excitation of the selected nuclear spins contained in the selected X-Y plane so that these nuclear spins supply a desired induction signal, and carrying out the measurements in pairs with nuclear spins oriented alternately in the same and in opposite direction to the homogeneous magnetic field M_O and subtracting the obtained induction signals from each other.

4,535,291

METHOD FOR SUPERCONDUCTING MAGNET SHIMMING

Reuy-Lin Lee, Fremont; George D. Kneip, Jr., Menlo Park, and Marvin H. Anderson, Mountain View, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Aug. 9, 1982, Ser. No. 406,418

Int. Cl.³ G01R *33/08*

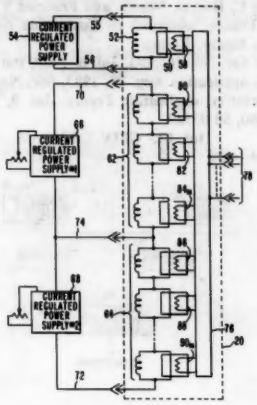
U.S. Cl. 324—320 **5 Claims**

2. Apparatus for selectively adjusting one of a plurality of interacting inductive elements, said inductive elements subject to a substantial mutual inductance therebetween, comprising

A. first current regulated power supply means operatively associated with a first inductive element for excitation thereof;

B. second current regulated power supply means operatively associated with the second inductive element for stabilizing the current flow thereof; and

C. means for varying a parameter of at least first said current regulated power supply means, thereby to vary the current in the first inductive element associated therewith, the second said power supply means compensating in-



duced current variations in the inductive element connected thereto.

4,535,292

TRANSMITTER FOR AN ELECTROMAGNETIC SURVEY SYSTEM WITH IMPROVED POWER SUPPLY SWITCHING SYSTEM

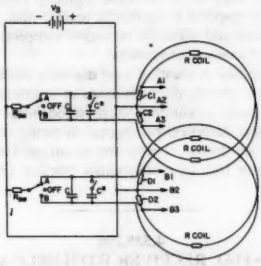
Lukas Ensing, Rijswijk, Netherlands, assignor to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Apr. 5, 1982, Ser. No. 365,298

Claims priority, application United Kingdom, Apr. 14, 1981, 8111781

Int. Cl.³ G01V *3/10, 3/16*

U.S. Cl. 324—330 **10 Claims**



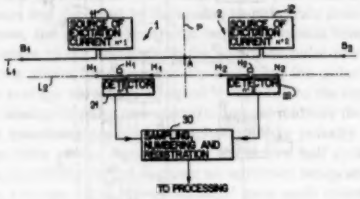
1. A geophysical large dipole moment transmitter for an airborne electromagnetic inductive survey system for emitting primary electromagnetic signals to the earth for the purpose of detecting conductive bodies at a large depth in an area by means of measuring secondary electromagnetic signals which are generated by eddy currents induced in the earth by the primary electromagnetic signals, said transmitter comprising: a unit comprising a plurality of assembled or stacked transmitting coils of large diameter for installation on an aircraft for radiating a primary electromagnetic signal to the area; a power supply means for said coils; a plurality of switches for connecting said power supply means to said coils; each of said coils connected through its own switch to said power supply means, and means for activating said switches of said coils simultaneously.

4,535,293

METHOD FOR GEOPHYSICAL PROSPECTING USING IMPULSINE CURRENTS

Jean-Pierre C. Rocroi, Massy, and Francois V. Gole, Meudon, both of France, assignors to Compagnie Generale de Geophysique, Massy, France

Division of Ser. No. 166,893, Jul. 8, 1980, Pat. No. 4,417,210.
This application Aug. 26, 1983, Ser. No. 526,727
Claims priority, application France, Jul. 9, 1979, 79 17766; Feb. 13, 1980, 80 03159
Int. Cl.³ G01V *3/02, 3/08*
U.S. Cl. 324—336 **26 Claims**



1. A method of geophysical prospecting to obtain a figurative representation for geophysical interpretation, comprising:

(a) positioning a first transmitter dipole and a first receiver dipole in cooperation with subsoil;

(b) supplying an impulsive excitation current to said first transmitter dipole, said current comprising a group of excitation pulses of alternate polarity, each followed by a zero current;

(c) detecting transient signals, produced at the output of said first receiver dipole;

(d) defining predetermined time intervals consecutive to said excitation pulses and simultaneous to said zero current and which include substantially all useful parts of said transient phenomenon, wherein said detecting occurs as a function of time, at least during said time intervals;

(e) preprocessing said signals including sampling, digitalizing, recording and temporally marking said signals during said time interval to produce digitally recorded samples which correspond temporarily to said time intervals;

(f) processing said digitally recorded samples, wherein said step of processing comprises:

(i) statistically evaluating said digitally recorded samples of said transient phenomenons as a function of time;

(ii) after said evaluating step, smoothing said digitally recorded samples by digital filtering to produce a smoother digital representation of said transient phenomenon free of a substantial portion of surrounding noise.

4,535,294

DIFFERENTIAL RECEIVER WITH SELF-ADAPTIVE HYSTERESIS

James P. Ericksen, Windsor, and Timothy F. Stack, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 22, 1983, Ser. No. 468,613
Int. Cl.³ H03K *5/153, 13/24, 19/092*
U.S. Cl. 328—150 **1 Claim**

1. Apparatus for providing unipolar conditioned output signal manifestations of a varying peak-to-peak amplitude bipolar input signal, comprising:

differential amplifier input means having two input nodes, responsive to the bipolar input signal at said input nodes for providing at an output node a bipolar first conditioned signal representative of the input signal having common mode noise rejected;

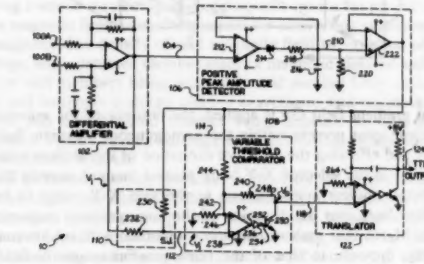
peak detector means responsive to said first conditioned signal for providing a bias voltage signal at an output node thereof at a present magnitude directly proportional to a present peak amplitude of said first conditioned signal;

summing means, responsive to said first conditioned signal and to said bias voltage signal for summing said first conditioned signal and said bias voltage signal thereby converting said first conditioned signal to a unipolar second conditioned signal;

comparator means; having a two-state output signal and having noninverting and inverting signal inputs with said inverting signal input responsive to said second conditioned signal and with said noninverting signal input responsive to said bias voltage signal at a first gain value in the presence of a first output state caused by a noninverting signal input magnitude greater than an inverting signal input magnitude and responsive to said bias voltage signal at a second gain value in the presence of a second output state caused by an inverting signal input magnitude greater than a noninverting signal input magnitude;

inverter means, responsive to said two-state output signal for providing inverted first and second output state signals;

switching means, responsive to said inverted first and second output state signals for providing a conditioned output



signal and for providing an effective ground path at a switched output node thereof in the presence of said inverted second output state and for opening said effective ground path in the presence of said inverted first output state;

variable voltage divider means, having three resistive legs with a common node connected to said noninverting input and having a first leg connected to said peak detector output node, a second leg connected to ground, and a third leg connected to said switching means' switched output node, said variable voltage divider means responsive to the switched state of said switching means for providing a voltage dividing network having said first leg in series with said second leg only in the presence of said inverted first output state and having said first leg in series with said second and third legs in parallel in the presence of said inverted second output state; and

signal level translator means, responsive at a first input to said conditioned output signal and responsive at a second input to said bias voltage signal for translating said conditioned output signal to a conditioned output signal manifestation compatible with TTL logic.

4,535,295

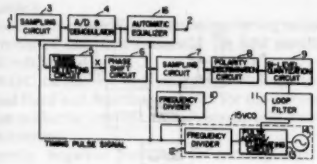
METHOD AND DEVICE FOR CONTROLLING THE PHASE OF TIMING SIGNAL

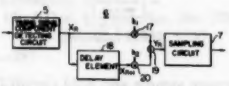
Yoshiro Kokuryo, Kodaira, Japan, assignor to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,225
Claims priority, application Japan, Nov. 27, 1981, 56-189305
Int. Cl.³ H03K *5/153*
U.S. Cl. 328—155 **7 Claims**

1. A timing signal pulse control circuit comprising timing signal component detecting means for extracting a timing signal component from a received signal, a sampling circuit

which samples said timing signal component in response to the output pulses of a digital signal generator, means including a phase shift circuit for shifting the phase of the output signal from said sampling circuit, detection means for detecting the zero-cross point of the phase-shifted signal produced by said





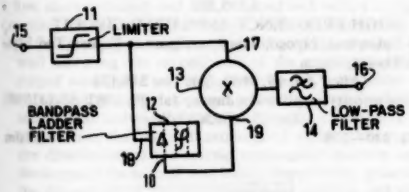
phase shift circuit, and control for controlling the phase of the output of said digital signal generator in response to the output of said detection means so that the output pulses of said digital signal generator are produced at the zero-cross points of the phase shifted signal produced by said phase shift circuit.

4,535,296

FM-DEMODULATOR WITH LADDER FILTER DELAY LINE AND MULTIPLIER

Mohammed Hajj Chehade, Asnieres; Jean Lecat, Suresnes, and Claude Tartois, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 12, 1982, Ser. No. 397,254
Claims priority, application France, Jul. 24, 1981, 81 14453
Int. Cl.³ H03D *3/02;* **H03K** *9/06*
U.S. Cl. 329—103 **5 Claims**



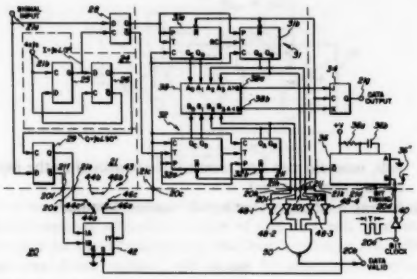
1. An FM-demodulator comprising a multiplier circuit and a phase shifting circuit, an input of the multiplier circuit being electrically connected to an input of the phase shifting network, a further input of the multiplier circuit being directly electrically connected to an output of the phase shifting circuit, characterized in that the phase shifting circuit comprises at least one section from a plurality of sections of a bandpass-ladder filter having a short and constant group time delay and at most a number of sections which is less than the total number of sections of said bandpass filter, whereby signal reflections via the unused section or sections of said bandpass filter are used to obtain an improvement in the linearity of the phase shift variation within the passband.

4,535,297

BINARY SIGNAL DEMODULATOR WITH COMPARATIVE VALUE DECISION CIRCUITRY

Charles M. Puckette, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 9, 1984, Ser. No. 569,429
Int. Cl.³ H03D *3/00*
U.S. Cl. 329—126 **18 Claims**



1. In a demodulator for recovering binary data bits from a received signal varying between first and second frequencies, said demodulator comprising: means for generating first and second reference frequency signals in phase-quadrature; first and second mixing means each receiving a different one of the phase-quadrature local reference signals for each converting the received signal to respective complementary first and second output signals; first and second counting means each respectively for counting a respective number of transitions in a predetermined direction of the respective first and second output signals of said first mixing means, responsive to a clock signal recovered from one of said second mixing means output signals; and output means for providing a recovered binary data signal responsive to the contents of said first and second counting means during each of a plurality of data bit time intervals, the improvement comprising:

means for substantially reversing the phase of the clock signal applied to both said counting means at a predetermined time during each data bit time interval; and

said output means determines the binary value of the demodulator recovered data output signal by a comparison, at the completion of each binary data bit time interval, of the count in said first counting means with the count in said second counting means.

4,535,298

DRIVER CIRCUIT

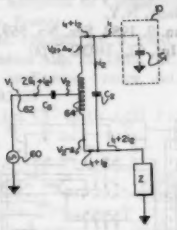
Dennis H. Covill, Tantallon, Canada, assignor to Nautical Electronics Laboratories Limited, Nova Scotia, Canada

Filed Nov. 7, 1983, Ser. No. 549,479
Claims priority, application Canada, Nov. 17, 1982, 415785
Int. Cl.³ H03F *3/68*
U.S. Cl. 330—189 **17 Claims**

1. A circuit for use in connecting a source of RF driving voltage to an amplifier input comprising:

a transformer having a center tap, a first terminal connected to a first branch of said transformer and a second terminal connected to a second branch of said transformer;

a first capacitor connecting said source to said center tap;
a second capacitor connecting said first and second terminals, wherein said first terminal is connected to the input of said amplifier; and
a dummy load connected to said second terminal.

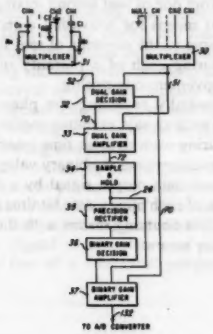


4,535,299

COMPOUND FLOATING POINT AMPLIFIER

George L. Streckmann, Dallas, and Ralph A. Harris, Hockley, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 14, 1983, Ser. No. 504,333
Int. Cl.[3] H03G 3/10
U.S. Cl. 330—279 12 Claims



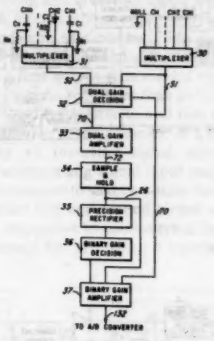
1. A compound floating point amplifier for amplifying an analog signal for presentation to an analog-to-digital converter, comprising:
(a) means connected to receive the analog signal, for providing a signal representative of the slew rate of the analaog signal;
(b) dual gain amplifying means connected to receive the analog signal and the slew rate signal, for performing a single gain step if the signals are within a predetermined range;
(c) sample and hold means connected to receive the output from the dual gain amplifying means and to store that output; and
(d) binary gain amplifying means for receiving the output of the sample and hold means, for modifying the gain of the binary gain amplifying means in response to the output of the sample and hold means.

4,535,300

EXTENDED RANGE SAMPLE AND HOLD CIRCUIT

George L. Streckmann, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 14, 1983, Ser. No. 504,334
Int. Cl.[3] H03G 3/10
U.S. Cl. 330—279 20 Claims



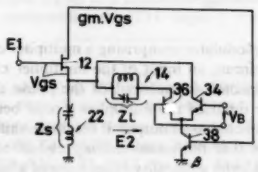
1. An extended range sample and hold circuit for receiving a varying analog signal input, sampling the signal at a predetermined time and holding the sampled signal, comprising:
(a) input means for receiving the varying analog signal input;
(b) sample switch means, selectively operable to pass the varying analog signal when closed and to block the varying analog signal when opened at the predetermined time;
(c) sample holding means connected to the sample switch means for holding an amplitude sample of the varying analog signal when the sample switch means is opened at the predetermined time;
(d) output amplifier means having an output connected to the input means and also to provide the output for the sample and hold circuit; and
(e) nonlinear circuit means connected to the output of the sample holding means and to the input of the output amplifier means for providing a signal to the output amplifier means that ranges from a proportional fraction of the amplitude sample to essentially the amplitude sample, depending upon the amplitude of amplitude sample.

4,535,301

HIGH FREQUENCY AMPLIFIER CIRCUIT

Kazuo Takayama, Hyogo, Japan, assignor to Fujitsu Ten Limited, Hyogo, Japan

Filed Jul. 19, 1983, Ser. No. 515,171
Claims priority, application Japan, Jul. 28, 1982, 57-131598
Int. Cl.[3] H03G 3/10
U.S. Cl. 330—279 1 Claim



1. A high frequency amplifier circuit comprising:
a series resonance circuit resonating at a desired frequency,
a first transistor to the gate of which signals are applied and to the source of which is connected said series resonance circuit,

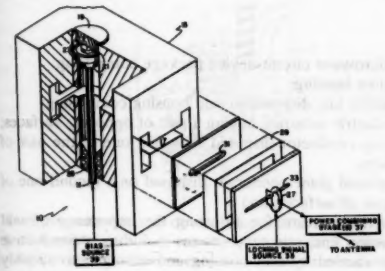
a second transistor to the base of which is applied an output signal from said first transistor,
third and fourth transistors having their emitters connected to said second transistor,
the collector of said third transistor being connected to said source of said first transistor,
a parallel resonance circuit resonating at said desired frequency,
the collector of said fourth transistor being connected to said source of said first transistor via said parallel resonance circuit, and
an AGC circuit for applying AGC voltage to the bases of said third and fourth transistors for the purpose of varying the collector current ratio of both said third and fourth transistors,
whereby negative feedback is accomplished and output power is obtained from said parallel resonance circuit.

4,535,302

MICROWAVE AMPLIFIER

Charles S. Ward; Richard W. Laton, both of Lexington, and John A. Spada, Revere, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 5, 1983, Ser. No. 558,217
Int. Cl.³ H03F *3/60*
U.S. Cl. 330—287 **1 Claim**



1. In a microwave amplifier utilizing an IMPATT diode as the active element therein, such diode being in circuit with the center conductor of a coaxial line coupled to a resonant cavity, the improvement wherein the resonant cavity is a section of a rectangular double-ridged waveguide, such waveguide having a first short-circuited end and a second end with a compound coupling iris formed therethrough, such iris comprising:
(a) a first rectangular opening formed centrally through a first wall covering the second end of the rectangular double-ridged waveguide and aligned with such waveguide; and
(b) a second rectangular opening formed centrally through a second wall outwardly spaced at a distance less than ¼ wavelength from the first wall and aligned with such waveguide, the dimensions of the second rectangular opening and the thickness of the second wall being, respectively, greater than the dimensions of the first rectangular opening and the first wall.

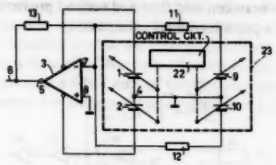
4,535,303

DRIVER CIRCUIT

Franciscus A. C. M. Schoofs, and Aloysius J. Nijman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,823
Claims priority, application Netherlands, Jul. 29, 1981, 8103572
Int. Cl.³ H03F *3/04*
U.S. Cl. 330—297 **10 Claims**

4. A driver circuit comprising a first integrated circuit amplifier having first and second operating voltage terminals, and an operating voltage supply comprising first and second voltage supplies of first and second voltages respectively of opposite polarity, said first and second voltage supplies having a common reference voltage point, the sum of the maximum values of said first and second voltages exceeding the breakdown voltage of said integrated circuit amplifier, first and second reference points having third and fourth voltages respectively



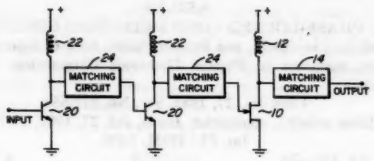
of lower maximum voltage than the voltages of said first and second supplies whereby the sum of said first and third voltages and the sum of said second and fourth voltages is less than said breakdown voltage, and means for alternately applying said first and third voltages respectively and said second and fourth voltages respectively, to said first and second terminals, respectively.

4,535,304

HIGH FREQUENCY AMPLIFIER WITH PHASE COMPENSATION

Paul Bura, Montreal, Canada, assignor to Northern Telecom Limited, Montreal, Quebec, Canada

Filed Apr. 19, 1984, Ser. No. 602,210
Claims priority, application Canada, Apr. 2, 1984, 451108
Int. Cl.³ H03F *3/16*
U.S. Cl. 330—300 **6 Claims**



1. A high frequency amplifier comprising a plurality of cascaded amplifier stages, wherein at least one of said stages comprises a Schottky-gate field-effect transistor amplifier stage which produces a positive phase change with increasing signal level, and at least one other of said stages comprises a bipolar transistor amplifier stage which produces a negative phase change with increasing signal level, said negative phase change compensating for said positive phase change.

4,535,305

TRANSMISSION GATE RELAXATION OSCILLATOR HAVING COMPARATOR

Kenji Matsuo, and Akira Yamaguchi, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

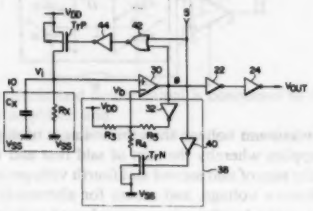
Filed Jul. 27, 1982, Ser. No. 402,223
Claims priority, application Japan, Jul. 30, 1981, 56-119766; Jul. 30, 1981, 56-119767
Int. Cl.³ H03K *3/26*
U.S. Cl. 331—111 **17 Claims**

1. A transmission gate relaxation oscillator circuit comprising:
first and second power source terminals;

a capacitor and resistor (CR) circuit including a parallel connection of a capacitor and a resistor;

transmission gate circuit means connected in series with said CR circuit between said first and second power source terminals, for controlling a current flowing through said CR circuit in response to a gate control signal;

a reference voltage circuit connected between said first and second power source terminals to produce a reference voltage which is obtained by dividing a power source voltage between said first and second power source terminals at a predetermined ratio; and



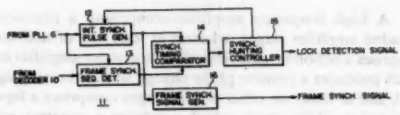
comparing circuit means including first and second resistors, and a comparing circuit having first and second input terminals and an output terminal, said first input terminal being connected to a first junction between said CR circuit and said transmission gate circuit means through said first resistor, said second input terminal being connected to receive said reference voltage from said reference voltage circuit, and said output terminal being connected to said first input terminal through said second resistor for comparing a voltage at said first junction with said reference voltage to form said gate control signal and feeding said gate control signal back to said first input terminal.

4,535,306

PHASE-LOCKED LOOP DETECTING CIRCUIT

Tadahiro Yamaguchi, and Ryuichi Naito, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 27, 1983, Ser. No. 517,554
Claims priority, application Japan, Jul. 27, 1982, 57-131008
Int. Cl.³ H03L *7/00*
U.S. Cl. 331—23 **8 Claims**



1. An apparatus for detecting the occurence of proper phase lock between the output of a phase-locked loop and a received composite signal containing a timing component, comprising:

means for producing a frame synchronization sequence detection signal having pulses in synchronization with the occurrence of frame synchronization sequences in said composite signal;

means for producing an internal synchronization pulse signal in response to said output of said phase-locked loop, said internal synchronization pulse signal having a phase determined in accordance with a control signal supplied to said means for producing said internal synchronization pulse signal;

means for detecting whether or not pulses of said internal synchronization pulse signal and said frame synchronization sequence detection signal are in time coincidence and producing a reset signal when time coincidence occurs and no reset signal otherwise; and

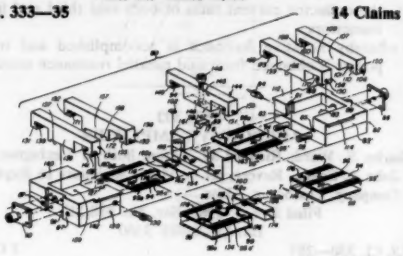
synchronization hunting controller means operating in response to said reset signal for producing a control signal and a lock detection signal, said control signal being applied to said internal synchronization pulse generator.

4,535,307

MICROWAVE CIRCUIT DEVICE PACKAGE

Toshikazu Tsukii, 89 Austin Rd., Sudbury, Mass. 01776

Filed Jun. 30, 1982, Ser. No. 393,961
Int. Cl.³ H01P *5/00*
U.S. Cl. 333—35 **14 Claims**



1. A microwave circuit device package comprising:

a conductive housing;

a transmission line disposed in said housing comprising:

(i) a dielectric substrate having a pair of opposing surfaces;

(ii) a strip conductor disposed on a first one of the pair of surfaces;

(iii) a ground plane conductor disposed on a second one of the pair of surfaces; and

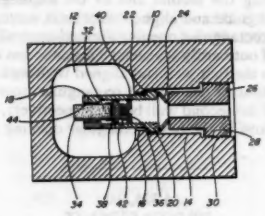
a slidable tuner means for adjusting the impedance of said transmission line, said tuner means including a conductive member carried by said housing and arranged to slidably traverse only over an exposed surface portion of the strip conductor portion of the transmission line.

4,535,308

MICROWAVE CAVITY TUNER

Maciej E. Znojkiewicz, Mount Royal, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 15, 1983, Ser. No. 532,388
Claims priority, application Canada, May 16, 1983, 428267
Int. Cl.³ H01P *7/06*
U.S. Cl. 333—232 **5 Claims**



1. A microwave device comprising a housing containing a cavity with a hole through one wall thereof, a tubular member of a material having a thermal coefficient of expansion that is low in comparison to the thermal coefficient of the housing, said tubular member being supported by one end portion positively located in the hole with its other end portion projecting into the cavity, and a dielectric tuner element located in said

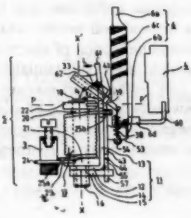
other end portion so as to protrude therefrom into the cavity, the tuner element being movable relative to the tubular member to vary the extent of protrusion, wherein the tuner element comprises a slug of dielectric material protruding partly from the tubular member and supported at one end in the tubular member by a metallic support member cooperating with the interior of the tubular member, means being provided for preventing the movement of the support member beyond a predetermined distance from the inner end of the tubular member such that the support member is R.F. shielded by the tubular member.

4,535,309

MAGNETO-THERMAL DEVICE FOR OVERCURRENT RELAYS

Dominique Moreau, Saint Germain en Laye; Pierre Duchemin, Fourqueux, and Jean-Pierre Duchemin, Jouy le Moutier, all of France, assignors to La Telemecanique Electrique, Nanterre, France

Filed Feb. 17, 1984, Ser. No. 581,160
Claims priority, application France, Feb. 23, 1983, 83 02909
Int. Cl.³ H01H *75/10*
U.S. Cl. 335—42 **5 Claims**



1. A magneto-thermal device adapted for causing the opening of a safety switch when the current which passes therethrough presents either an excessive instantaneous intensity or a smaller intensity but of too long a duration, said device comprising a bi-metallic strip, a magnetizable yoke with which are associated, on the one hand, an adjustable screwed core which is surrounded by a coil and, on the other hand, a plate angularly movable about one end of the yoke for cooperating with an end of this core placed substantially at the same level and against a return spring, and locking means associated with this core for ensuring the adjustment position, wherein, in a plane PP' perpendicular to the axis XX' of the core and adjacent the end of the yoke serving as a pivot for the plate said locking means comprising a flat non magnetizable piece which is placed under radial compression between the end of the core and a face of a leg of the yoke situated opposite thereto, the radial dimension of said piece being slightly greater than the distance which separates said end and said face in the absence of said piece.

4,535,310

PNEUMATIC TIMING ATTACHMENT FOR AN ELECTROMAGNETIC DEVICE

Allin W. Schubring, Milwaukee, and Robert W. Sehmer, Grafton, both of Wis., assignors to Square D Company, Palatine, Ill.

Filed Sep. 2, 1983, Ser. No. 528,906
Int. Cl.³ H01H *7/03*
U.S. Cl. 335—61 **19 Claims**

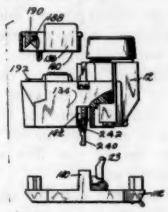
1. A timer attachment for an electromagnetically operated device wherein the device includes:

a housing having a front end and a member that is movable in the housing from an at rest position to an operated position in response to an energization of an electromagnet, said attachment comprising:

a housing part secured at the front end of the device housing in either of two selected positions, an operator movable along an axis in the housing part, means in the housing part for translating movement of the member to the operator for causing the operator to move from a first position to a second position an adjusted interval after the member is moved from the at rest position to the operated position when the housing part is secured at the front end of the housing in one of the two selected positions and for causing the operator to move from the second position to the first position an adjustable interval after the member moves from the operated position to the at rest position when the housing part is secured at the front end of the housing in a second of the two selected positions,

a cover secured at a front end of the housing part,

a slider mounted for movement adjacent a rear surface of the



cover, said slider having a pair of spaced advisory legends on a front surface that is adjacent the rear surface of the cover with the distance between the legends equal to a distance between a pair of openings in the cover,

a pair of oppositely facing inclined surfaces extending rearwardly from a rear surface of the slider,

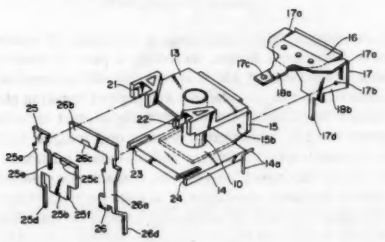
and a pair of individually operable plungers extending through the housing part with each of the plungers having a first end engagable with one of the inclined surfaces and a second end engageable with portions of the housing for actuating one of the plungers and moving the slider in a first direction when the housing part is secured to the housing in the first position and actuating a second one of the two plungers and moving the slider in a direction opposite the first direction when the housing part is mounted in the second position.

4,535,311

CONTACT SUPPORT MEANS FOR AN ELECTROMAGNETIC RELAY

Naoto Okihara; Masayuki Morimoto, and Tatsumi Ide, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 16, 1984, Ser. No. 610,685
Claims priority, application Japan, May 20, 1983, 58-88449; Sep. 30, 1983, 58-152899[U]
Int. Cl.³ H01H *67/02*
U.S. Cl. 335—124 **11 Claims**



1. An electromagnetic relay comprising:

a pair of first and second insulative supports in spaced apart parallel relationship;

a first stationary member of conductive material having a first, elongated portion extending between said first and second supports and a second portion extending in a direction normal to said first portion, said second portion having a first stationary contact element therein and a heat radiating surface for radiating a substantial amount of heat generated in said first stationary contact element in response to an arc on the surface of said first stationary contact element so that heat conducted to said supports is insufficient to cause them to fuse or vaporize;

a second stationary member of conductive material having a third, elongated portion extending between said first and second supports and a fourth, elongated portion extending in a direction normal to said third portion in spaced relationship to said second portion, said fourth portion having a second stationary contact element therein in opposed relationship with said first stationary contact element;

a movable member of conductive material having an elongated portion movable between said first and second stationary contact elements and having a pair of contact elements one on each side thereof for selectively making contact with one of said first and second stationary contact elements; and

means secured between said first and second supports for generating magnetic flux in response to a current supplied thereto for moving the elongated portion of said movable member into contact with one of said first and second stationary contact elements.

4,535,312

ELECTRICAL CONTACT UNITS

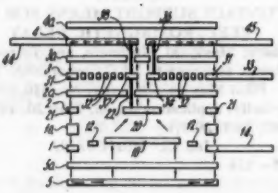
Ronald W. Lomax, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 8, 1983, Ser. No. 530,182

Claims priority, application United Kingdom, Sep. 8, 1982, 8225565

Int. Cl.³ H01H *1/54*

U.S. Cl. 335—196 **27 Claims**



27. A contact unit comprising: a structure of laminated operable component layers, including a pair of conductive contacts, at least one of which is magnetically susceptible and moveable relative to the other for making and breaking electrical contact therebetween, said moveable contact including a stationary portion, a moveable portion and integral resilient means connecting the stationary and moveable portions;

an insulator laminated between the contacts for maintaining spaced insulated separation of at least portions thereof;

ferromagnetic means for producing a magnetic flux through at least one of said magnetically susceptible contact layers for effecting relative movement of one contact with respect to the other for causing said contacts to make and break electrical contact therebetween.

4,535,313

ELECTROMAGNETIC DEFLECTION UNIT AND COLOR DISPLAY TUBE PROVIDED WITH SUCH A UNIT

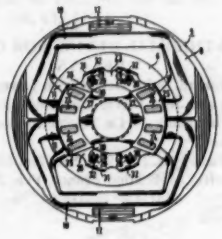
Martin C. Van der Heijde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 18, 1984, Ser. No. 651,964

Claims priority, application Netherlands, Sep. 21, 1983, 8303238

Int. Cl.³ H01F *1/00*; 313 *421;426;429;430;431*

U.S. Cl. 335—212 **6 Claims**



1. An electromagnetic deflection unit for a color display tube comprising a conical coil holder which carries a set of coils for the horizontal deflection of electron beams, said coils having segments which extend substantially in the longitudinal direction of the coil holder, soft-magnetic members being arranged on the inwardly facing side of said coils in the proximity of the said segments, said soft-magnetic members being incorporated in an annular body of synthetic material.

4,535,314

VARISTOR INCLUDES OXIDES OF BISMUTH, COBALT, MANGANESE, ANTIMONY, NICKEL AND TRIVALENT ALUMINUM

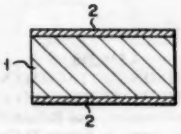
Hideyuki Kanai, Kawasaki; Takashi Takahashi, Tokyo; Motomasa Imai, Tokyo, and Osamu Furukawa, Sagamihara, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 19, 1983, Ser. No. 563,250

Claims priority, application Japan, Dec. 24, 1982, 57-226208

Int. Cl.³ H01C *7/10*; C04B *35/00*

U.S. Cl. 338—21 **4 Claims**



1. A varistor formed of a sintered body consisting essentially of:

zinc oxide as a major component;

0.1 to 5 mol % of bismuth in terms of Bi_2O_3;

0.1 to 5 mol % of cobalt in terms of Co_2O_3;

0.1 to 5 mol % of manganese in terms of MnO;

0.1 to 5 mol % of antimony in terms of Sb_2O_3;

0.1 to 5 mol % of nickel in terms of NiO; and

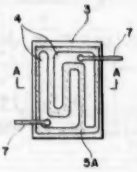
0.001 to 0.05 mol % of aluminum in terms of Al^{3+}.

4,535,315

ALKANE GAS SENSOR COMPRISING TIN OXIDE SEMICONDUCTOR WITH LARGE SURFACE AREA

Sai Sakai, Osaka, Japan, assignor to New Cosmos Electric Co., Ltd., Japan

Filed Dec. 22, 1983, Ser. No. 564,445
Claims priority, application Japan, Dec. 28, 1982, 57-227567
Int. Cl.[3] G01N 27/12; H01L 7/00
U.S. Cl. 338—34 3 Claims



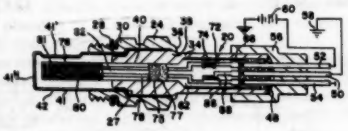
1. An alkane gas sensor comprising a semiconductor composed of sintered tin oxide and adapted to absorb an alkane gas thereby decreasing an electric resistance of the sensor so as to detect existence of said gas, wherein a specific surface area of the semiconductor is at least thirty square meters per gram.

4,535,316

HEATED TITANIA OXYGEN SENSOR

Harry P. Wertheimer, Findlay, Ohio; Thomas A. Libsch, Novi, Mich.; Jerome L. Pfeifer, Livonia, Mich., and Paul C. Becker, Bloomfield Hills, Mich., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 26, 1984, Ser. No. 593,076
Int. Cl.[3] G01N 27/46, 27/12; H01L 7/00
U.S. Cl. 338—34 5 Claims



1. A resistive type sensor for detecting oxygen in an exhaust gas of an operating engine, said exhaust gas having a temperature of from 200° to 850° C., said sensor supplying an electronic control unit with an input signal to maintain a desired air to fuel ratio for operating said engine, said sensor comprising:

an insulating substrate having a first side and a second side with a first end and a second end;

a band of an electrically conductive thick film located on said first side, said band forming a loop that extends from said first end to said second end, said band having a substantially constant width from said first end to a location adjacent said second end where the band width is reduced, said thick film having an electrical resistance that increases with temperature, said loop having one end connected to a voltage source and its other end connected to an electrical ground, said thick film in resisting the flow of electrical current to said ground creating thermal energy adjacent said second end, said electrically conductive thick film sensor having a positive temperature coefficient of about 3.8×10^{-3}/° C., said reduced width of said band of electrical conductive thick film having a pattern such that any power loss in the constant width portion of said loop is substantially eliminated to maintain the temperature of said second end within a temperature range of from 650° to 900° C. at substantially all times when voltage is available;

a first strip of an electrically conductive thick film located on said second side and extending from said first end to said second end, said first end of said first strip being connected to said voltage source;

a second strip of an electrically conductive thick film located on said second side and extending from said first end to said second end, said first end of said second strip being connected to said electronic control unit;

a titania film applied to said second ends of said first and second strips to provide an electrical conductive path between said first and second strips;

a third strip of an electrical conductive thick film located on said second side for connecting said second resistor with said electrical ground;

a fixed value resistor connected in series within said first strip;

a second fixed value resistor connected to said second strip and electrical ground, said titania film responding to changes in the amount of oxygen in the exhaust gas by modifying the flow of electrical current in said first strip and said second strip, said first and second fixed value resistors being selected such that the total voltage drop between said second and third strips varies from near 0 to 900 mV as the resistance of said titania film changes from near 100K ohms to near 100 ohms as the amount of oxygen in the exhaust gas correspondingly changes from near 10^{-3} to near 10^{-14} atmospheres, said resistance to current flow being indicative of said voltage drop and communicated through said second strip as an input signal to operate said control unit;

a coating of alumina borosilicate glass material applied to said titania film to prevent particles in said exhaust gas from being deposited on said electrical conductive path, said glass material having sufficient porosity to allow exhaust gas to flow to said electrical conductive path without effecting the development of said input signal; and

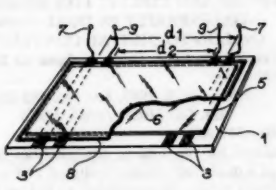
a coating of alumina silicate glass glaze applied to said band and to said first and second strips of electrically conductive thick film to prevent carbon particles carried by said exhaust gas from being deposited thereon and establishing electrical conductive shorting paths that could affect the development of said input signal.

4,535,317

PIEZORESISTIVE GAUGE FORMED BY AN ELECTRICALLY CONDUCTIVE ORGANIC COMPOUND

Roland Canet, Lormont; Pierre Delhaes, Gradignan; Eliane Dupart, Cestas; Adolphe Pacault, Tolence; Claude Pascal, Cestas, and Jean-Pierre Manceau, Prêignac, all of France, assignors to Commissariat a l'Energie Atomique, France

Filed Dec. 19, 1985, Ser. No. 562,523
Claims priority, application France, Dec. 21, 1982, 82 21445
Int. Cl.[3] H01C 10/10; G01L 1/18
U.S. Cl. 338—36 8 Claims



1. A piezoresistive gauge that is particularly sensitive to pressure between 500 bars and a few kilobars comprising a piezoresistive element constituted by an electricity-conducting organic compound chosen from the group consisting of tetramethyl-tetrathiofulvalene salts, the quaternary ammonium salts of tetracyanoquinodimethane and diethyl-dimethyl-tetra-

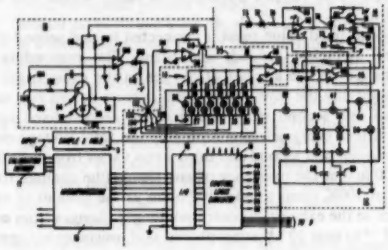
thiofulvalene-tetracyanoquinodimethane (DEDMTFF-TCNQ).

4,535,318

CALIBRATION APPARATUS FOR SYSTEMS SUCH AS ANALOG TO DIGITAL CONVERTERS

Peter S. Duryee, Lynnwood, and John M. Anholm, Jr., Snohomish, both of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Nov. 16, 1983, Ser. No. 552,589
Int. Cl.³ H03K *13/09*
U.S. Cl. 340—347 CC **2 Claims**



1. In a recirculation of remainder type analog-to-digital converter, a calibration circuit, comprising:

a digital reference signal source;

digital to analog converter means responsive to said digital reference signal source for generating an analog reference signal;

sources of digital and analog calibration signals;

comparator means for comparing said analog calibration and analog reference signals and generating an indicator signal when said analog calibration and analog reference signals have a predetermined relationship;

means for controlling said digital reference signal source to generate a predetermined pattern of digital reference signals;

means for determining a first pattern of digital reference signals that, together with said digital calibration signals, causes said comparator means to generate said indicator signal;

means for determining a second pattern of digital reference signals that, together with said input analog calibration signals, causes said comparator means to generate said indicator signal; and

means for storing the difference between said first and second patterns of digital reference signals as conversion coefficients.

4,535,319

METHOD AND CIRCUIT FOR MEASURING NONLINEARITY IN DUAL-FLASH ANALOG-TO-DIGITAL CONVERTER

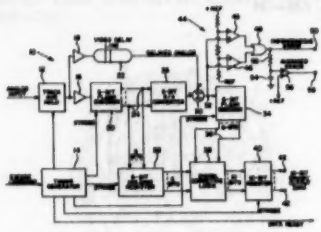
Bruce J. Penney, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 8, 1983, Ser. No. 483,323
Int. Cl.³ H03K *13/02, 13/75*
U.S. Cl. 340—347 AD **19 Claims**

1. A method for diagnosing nonlinearities in the internal operation of a dual-flash analog-to-digital converter including a first quantizer means for quantizing an analog input signal in accordance with a plurality of coarse quantizing levels to produce a more-significant-digits digital output signal, numerically indicating a truncated portion of the analog input signal, and a remainder analog signal corresponding to the undigitized portion of the analog input signal, and a second quantizer means for quantizing the remainder analog signal in accordance with a plurality of fine quantizing levels to produce a less-significant-digits digital output signal numerically indicating the value of the remainder analog signal; the method comprising:

applying an analog input test signal to the converter;

repetitively actuating the converter to convert said test signal to produce said digital output signals and remainder analog signal;



comparing the remainder analog signal to a predetermined threshold to produce an error signal whenever the remainder analog signal exceeds said threshold; and

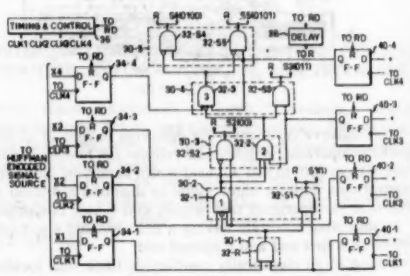
averaging the error signals from a plurality of successive actuations of the converter to produce an average error signal.

4,535,320

METHOD AND APPARATUS FOR DIGITAL HUFFMAN DECODING

Charles S. Weaver, Palo Alto, Calif., assignor to Digital Recording Research Limited Partnership, Menlo Park, Calif.

Filed Jun. 22, 1984, Ser. No. 623,342
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **19 Claims**



1. In a digital decoder for decoding encoded digital data words which have been encoded using a code comprising a plurality of different length code words, said decoder comprising

a plurality of logic gates connected in the form of a binary decoding tree having branches and interior and leaf nodes,

means for supplying bits of encoded digital data words to gates of the tree, said bits being supplied to gates at different levels of the tree dependent upon the position of the bit in the encoded word,

a plurality of gate enable lines coupled to gates at different levels of the tree for selectively enabling said gates, different gate enable lines being connected to different gates of the tree,

means for sequentially supplying said gate enable lines with gate enable signals for sequentially enabling gates of the tree, an increasing number of gate enable lines being si-

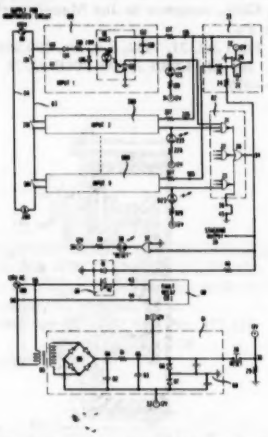
multaneously supplied with gate enable signals as gate enable signals are sequentially supplied to said gate enable lines, outputs from gates associated with leaf nodes of the binary decoding tree being indicative of the digital data word.

4,535,321

METHOD AND SYSTEM FOR MONITORING FAULTS IN ELECTRICAL CIRCUITS

Craig Merz, R.D. 3, Box 224, First St., Califon, N.J. 07830

Filed May 21, 1984, Ser. No. 612,551
Int. Cl.[3] G08B *19/00*
U.S. Cl. 340—520 **6 Claims**



1. A monitoring circuit for detecting and indicating the first of a series of faults in one or more electrical systems comprising a plurality of N switches connected to a source of power which comprises in combination:

a series of N isolated input circuits each connected across a corresponding one of said switches, and each said isolated input circuits including a triggering optical signal means for producing an optical signal in response to disconnect of one of said switches;

an optical responsive device corresponding to, and optically, but not electrically, coupled to each of said triggering optical signal means, each said optical responsive device having means responsive to a signal from said triggering optical signal means to impose a threshold voltage V_t across said optical responsive device, at which voltage said optical responsive device becomes conducting, said device being constructed and arranged once it has been rendered conducting to remain conducting even when the voltage across said device falls below the threshold voltage V_t to a lower voltage V_G;

display optical signal means connected in energy transfer relation to each said optical responsive device, and constructed and arranged to produce an optical signal as long as said optical responsive device remains conducting;

the outputs of said optical responsive devices connected in cascaded arrangement with a succession of stacked gating devices constructed and arranged to produce an output signal whenever at least one of said optical responsive devices becomes conducting;

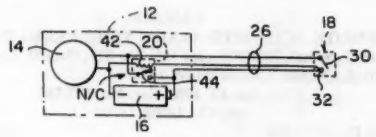
lock-out means connected to receive an output signal from said cascaded gating circuits and in response to said received signal to impose a negative voltage $-V_n$ across each of said optical responsive devices, thereby to negatively bias each said optical responsive device to maintain a voltage V_t across each said optical responsive device in response to a signal received from said triggering optical signal means in any of said isolated input circuits, wherein V_t is below V_t but above a voltage V_G, whereby only the optical responsive device which is initially conducting after receiving the first said optical signal, remains conducting, and the other optical responsive devices are disabled from becoming conducting in response to subsequent received signals.

4,535,322

SKI THEFT ALARM AND RUNAWAY SKI LOCATOR

Frederick R. Yeski, 23 Hughes St., Plainville, Conn. 06032

Filed Aug. 1, 1983, Ser. No. 519,258
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—571 **4 Claims**



1. A ski alarm and locator which comprises:

(a) a housing for mounting to the top surface of a ski;

(b) an audible signaling device within the housing;

(c) a power source within the housing;

(d) a remote switch which, via a cable, connects the power source to the audible signaling device within the housing when the switch is closed; and

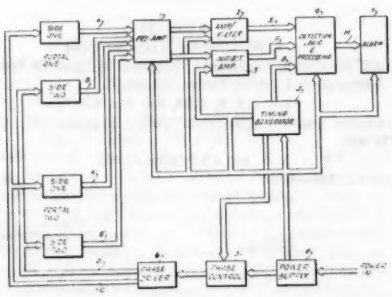
(e) a relay within the housing for connecting the power source to the audible signaling device when power to the relay is interrupted by cutting the cable to disconnect the remote switch.

4,535,323

PREAMPLIFYING AND SIGNAL PROCESSING METHOD AND APPARATUS FOR THEFT DETECTION SYSTEMS

Larry Eccleston, Marshall, Mich., assignor to Progressive Dynamics, Inc., Marshall, Mich.

Filed Mar. 15, 1982, Ser. No. 358,299
Int. Cl.[3] G08B *13/24*
U.S. Cl. 340—572 **25 Claims**



1. In a method of detecting the presence of a particular marker member within an electromagnetic interrogation field established between a pair of mutually spaced portal side members, wherein said electromagnetic field is made to alternate at one or more nominal frequencies and the field is monitored by at least first and second receiver means each disposed to access the field from a different side position at said portal to detect the presence of signal indicia introduced by such a marker in

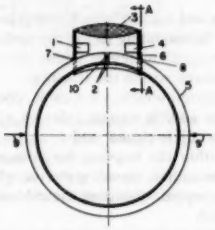
response to its exposure to the alternations of the field, and wherein said receivers each produce an electrical signal representative of the frequency content of the alternating field at least in the area of proximity nearer to that receiver, the improvement for use in detecting said marker which comprises the steps of: producing a first composite electrical signal for marker-presence analysis by summing representations of the said electrical signals produced by said first and second receivers, to thereby increase detection sensitivity; and producing a second composite electrical signal for use in marker-presence analysis by differencing representations of the said electrical signals produced by said first and second receivers, to reduce common-mode noise or other undesired signal characteristics in that composite electrical signal.

4,535,324

REMOTE ACTIVATED ALARM TRIGGERING DEVICE

Mark Leventa, 7925 Kingsley Rd., No. 811, Cote St. Luc, Montreal, Quebec, Canada (H4W 1P5)

Filed Jul. 12, 1982, Ser. No. 397,538
Int. Cl.³ G08B *13/02*
U.S. Cl. 340—574 **12 Claims**



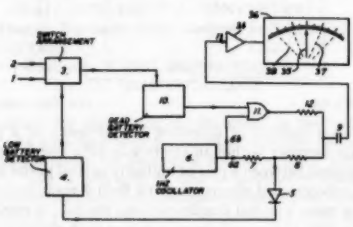
1. A remotely activated alarm triggering device comprising a transmitter means mounted in a casing which is secured to an incomplete finger ring, said ring having opposed free ends forming a gap, an electrical conductor secured to each of said opposed free ends, said gap forming a normally open contact, said normally open contact being closed by applying opposing forces on said ring by fingers adjacent said ring when worn to close the normally open contact whereby to activate said transmitter to generate a signal to activate a remote alarm circuit.

4,535,325

LOW CHARGE DETECTOR

Hugh R. Marsh, Canterbury, England, assignor to Thorn Emi Instruments Limited, Dover, England

Filed Jul. 5, 1983, Ser. No. 510,586
Claims priority, application United Kingdom, Jul. 8, 1982, 8219857
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—636 **6 Claims**



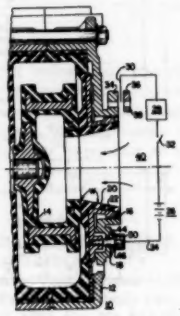
1. A low charge detector suitable for use in a measuring instrument comprising a meter having a moveable measuring indicator associated therewith and a rechargeable means for supplying power to the instrument, said detector comprising means for causing said indicator to execute oscillations of a first amplitude when said rechargeable means reaches a first predetermined level of exhaustion and means for causing the indicator to execute oscillations of a second amplitude when said rechargeable means reaches a second predetermined level of exhaustion.

4,535,326

LINER DETERIORATION WARNING FOR FLUID MOVERS

Lance A. Mullins, Colorado Springs, Colo., and Michael A. Self, Rockland, Calif., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Jul. 21, 1982, Ser. No. 400,566
Int. Cl.³ G08B *21/00*; F01B *25/26*
U.S. Cl. 340—679 **10 Claims**



1. A system for transporting an electrically conductive fluid medium, comprising:

a pump having a primary metallic casing through which a fluid is transported, said casing configured to removably receive an electrically non-conductive liner configured to overlay a substantial portion of the interior of said casing:

means, including a conductive member disposed within said casing, contiguous with said liner and electrically insulated from said fluid medium, for providing an electrical signal indicative of wear through a portion of said liner, said wear placing said conductive member into direct electrical contact with said electrically conductive fluid medium; and

means for providing an alarm in response to said signal.

4,535,327

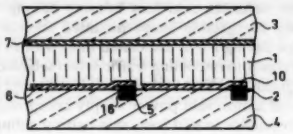
ELECTRICALLY CONTROLLED DISPLAY USING A THICK LAYER, NON-LINEAR ELEMENT AND ITS PRODUCTION PROCESS

Michel Hareng; Jean-Noël Perbet, and Michel Graciet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 23, 1982, Ser. No. 410,558
Claims priority, application France, Aug. 25, 1981, 81 16217
Int. Cl.³ G09G *3/00*
U.S. Cl. 340—719 **9 Claims**

1. A display for displaying images or pictures by electrical control of elementary display cells on a surface of a substrate, each cell comprising a material, whose optical properties vary as a function of an electrical field created by a voltage applied to a pair of first and second electrodes arranged in staggered manner parallel to said surface and forming a capacitor, each cell being connected to electrical connections carried by the substrate by means of a discrete varistor element for each cell whose resistance is a decreasing function of the voltage ap-

plied, wherein the substrate is formed from a refractory dielectrical plate, said discrete varistor elements being isolated from



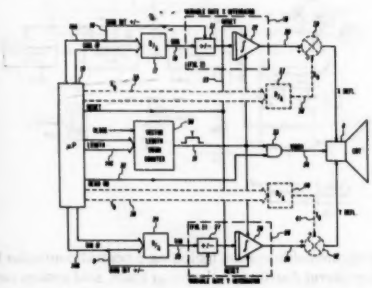
each other and having a first face in contact with said electrical connections and a second face in contact with one of said first and second electrodes.

4,535,328

DIGITALLY CONTROLLED VECTOR GENERATOR FOR STROKE WRITTEN CRT DISPLAYS

William A. Morey, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 13, 1982, Ser. No. 417,319
Int. Cl.³ G09G *1/08*
U.S. Cl. 340—739 **10 Claims**



1. An open loop system for developing deflection signals effective to position the beam of a cathode ray tube to impact the face of said cathode ray tube along a predetermined vector path comprising first and second signal integrating means;

means for developing first and second signals respectively proportional to the sine and cosine functions of the polar angle defining the slope of said vector;

means for applying said sine and cosine functions as respective inputs to said first and second signal integrator means;

means for enabling each of said first and second integrators as a direct function of time proportional to the length of said vector;

means for applying, for said period of time, the outputs of said first and second signal integrator means as respective inputs to the vertical and horizontal deflection signal generating means of said cathode ray tube; and

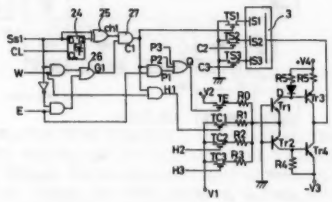
means for selectively resetting each of said first and second signal integrating means to zero at reset times exclusive of said period of time during which said integrators are integrating.

4,535,329

CONSTANT CURRENT/CONSTANT VOLTAGE DRIVE FOR AN ELECTROCHROMIC DISPLAY CELL

Katubumi Koyanagi; Hiroshi Take, both of Tenri, and Hisashi Uede, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 370,154, Apr. 21, 1982, abandoned, which is a continuation of Ser. No. 915,003, Jun. 13, 1978, abandoned. This application Aug. 18, 1983, Ser. No. 524,111
Claims priority, application Japan, Jun. 14, 1977, 52-70838; Jun. 16, 1977, 52-71714
Int. Cl.³ G09G *3/34*
U.S. Cl. 340—785 **2 Claims**



1. A display system comprising:

an electrochromic display having a predetermined number of display segments having at least on and off display states, each of said segments being associated with individual display electrodes and all associated with a counter electrode;

writing means for applying constant current to said counter electrode to place said display in an on display mode;

erasing means for applying a constant voltage to said counter electrode to place said display in an off display mode; and

selection means for connecting the display electrodes associated with display segments desired to be changed to ground, said selection means further energizing said writing means or said erasing means in correspondence with the display mode desired;

said writing means varying the magnitude of current applied to said counter electrode in correspondence with the numbers of display segments to be placed in an on display state.

4,535,330

BUS ARBITRATION LOGIC

Richard A. Carey, Ashland, and Jerry Falk, Medway, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

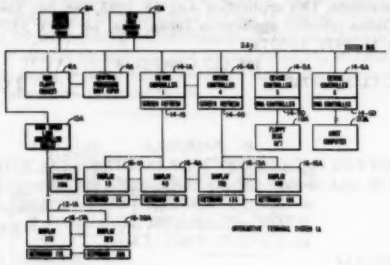
Filed Apr. 29, 1982, Ser. No. 372,907
Int. Cl.³ G06F *9/00*; H04Q *9/00*
U.S. Cl. 340—825.5 **8 Claims**

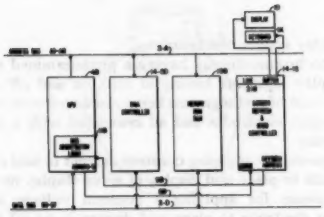
1. In an interactive computer terminal having a bus and various subsystems, accessing said bus according to their assigned priority level, such as a central processor unit (CPU), a direct memory access controller (DMA), a random access memory (RAM), terminal display unit, a keyboard, chip refresh controller, direct memory access channel (DMA), screen refresh controller and keyboard controller communicating with each other via a bus system, each of said subsystems having a priority level which may vary according to their individual states of operation, for accessing said bus, bus arbitration logic for arbitrating access to said bus among the various subsystems comprising:

(a) bus decoder means in said bus arbitration logic responsive to first electronic signals indicative of requests from said subsystems in different states of operation which have predetermined priority levels which vary according to the state of operation of the subsystem requesting access to

said bus, said decoder for decoding the first electronic signals into second electronic signals;

(b) first logic means responsive to said second electronic signals from said bus decoder means for providing third signals for awarding said bus system to one of said subsystems according to a priority level based on the state of operation of said subsystem, and;





(c) second logic means responsive to said first logic means for providing fourth signals for awarding access of said bus to said subsystems in accordance to predetermined different priority levels of said subsystems independent of their state of operation.

4,535,331

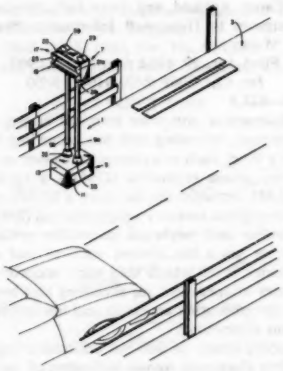
PORTABLE TRAFFIC WARNING LIGHT

Kurt L. Koenig, P.O. Box 68, Arnold, Mo. 63010

Filed Sep. 19, 1983, Ser. No. 533,120

Int. Cl.[3] G08G *1/095*; E01F *9/00*

U.S. Cl. 340—908 **5 Claims**



1. A portable traffic warning light having a base for support directly upon the ground, a lens housing, and a pair of columns extending up from said base, said columns being adjustable heightwise, said lens housing being supported on top of said adjustable columns, said lens housing having a plurality of selectively energizable lamps mounted therein with each of said lamps having a lens associated therewith so as to display a warning signal to oncoming traffic when selected of said lamps are energized, said base including a power supply for energization of said lamps, said power supply comprising at least one battery installable in said base, said battery aiding in and stabilizing said base and traffic warning light as it rests upon the ground, said columns being telescopically adjustable so as to vary the heighth of said lens housing above said base, said columns being detachable from said base and from said lens housing such that one pair of relatively short columns may be exchanged for a pair of relatively longer columns or vice-versa so as to vary the heighth of said lens housing, and a flexible power cable connecting said power supply to said lens housing, with said flexible power cable permitting vertical adjustable movement of said lens housing with respect to its supporting base.

4,535,332

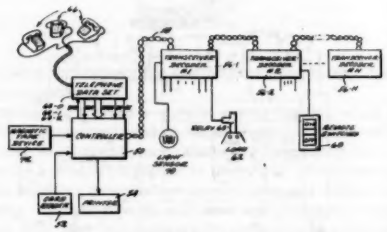
METHOD AND APPARATUS FOR CONTROLLING DISTRIBUTED ELECTRICAL LOADS

Edward B. Miller, West Warwick, R.I., and Charles W. Eichelberger, Schenectady, N.Y., assignors to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 89,478, Oct. 30, 1979, abandoned. This application Nov. 25, 1981, Ser. No. 325,031

Int. Cl.[3] H04Q *9/00*

U.S. Cl. 340—825.06 **12 Claims**



1. A programmable system including a central controller for controlling plural distributed electrical loads, said system comprising:

plural relays, each connected to control a respectively corresponding one of said plural distributed electrical loads,

plural remotely located transceiver decoders, each connected to control a predetermined subset of said relays in response to received and decoded data signals, and each transceiver decoder including mode control means for controlling the operational mode of said transceiver decoder in response to receiving a predetermined mulit-bit word,

a bi-directional data link comprising a common data communication link connected to each of said transceiver decoders,

a programmable central controller connected to said data link to provide said data signals to each of said transceiver decoders via said bi-directional data link and for controlling said relays,

the central controller and each transceiver decoder including data register means for holding a predetermined number of bits for transmission as a group to, and/or derived by reception as a group from, said bi-directional data link, and

said central controller including means for (a) repeatedly

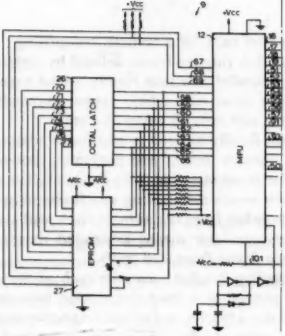
interrogating any given transceiver decoder, after issuing a control instrument thereto, for the then indicated present status or condition level of its controlled relay until a response is received therefrom, (b) annunciating an error condition if the interrogated transceiver decoder fails to respond, (c) self-clearing the error condition if a response is eventually received and (d) retransmitting an appropriate control instruction to the interrogated transceiver decoder if it responds with an incorrect status or condition level.

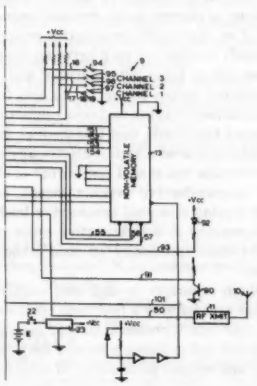
4,535,333

TRANSMITTER AND RECEIVER FOR CONTROLLING REMOTE ELEMENTS

Joseph W. Twardowski, Schaumburg, Ill., assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Filed Sep. 23, 1982, Ser. No. 422,452
Int. Cl.³ H04B 9/00; H04Q 9/00
U.S. Cl. 340—825.69 **12 Claims**





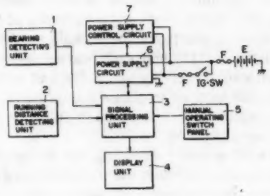
1. Apparatus for controlling a receiver with a remote radio frequency transmitter comprising a first micro-processor and a first memory means in said receiver for storing at least one address code, non-radio frequency transmitting means in said receiver, switch means for energizing said non-radio frequency transmitting means to transmit an address code, a non-radio frequency receiving means in said transmitter for receiving said address code, a second micro-processor and second memory means in said transmitter for storing said address code, radio frequency radiating means in said transmitter for radiating said address code, receiving means in said receiver for receiving said radio frequency radiated address code, said first micro-processor in said receiver comparing the received address code with the address code stored in said first memory, an output circuit energized by said comparing means when said addresses are the same, wherein said first memory means comprises a non-volatile memory and a programmable read only memory and said second memory means comprises a non-volatile memory and a programmable read only memory.

4,535,334

APPARATUS FOR VISUALLY INDICATING THE TRAVEL ROUTE OF AN AUTOMOTIVE VEHICLE

Katsutoshi Tagami; Tsuneo Takahashi, both of Saitama; Shinichiro Yasui, Tokyo, and Akira Ichikawa, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1982, Ser. No. 384,919
Claims priority, application Japan, Jun. 4, 1981, 56-86135
Int. Cl.³ G08G 1/12; G08B 1/00
U.S. Cl. 340—995 **2 Claims**



1. A travel route indicating apparatus for use in an automotive vehicle, wherein a current travel route of the automotive vehicle in terms of two-dimensional coordinates may be obtained arithmetically by means of signal processing means on the basis of the outputs from a travel distance detecting unit adapted to detect a current travel distance of the vehicle, and from a bearing detecting unit adapted to detect a resultant azimuth taken by the vehicle after the travel of the vehicle up to a current point of travel, so that the thus obtained locational data on the location of the vehicle varying from time to time may be stored in sequence, and so that the travel path of the vehicle may be continuously indicated, as the vehicle travels, on the screen of a display from the thus-obtained travel data leading to the resulting current location of the vehicle, which comprises, in operative combination:

power supply control circuit means for detecting the opening status of an ignition key switch and outputting a power conducting command for a predetermined period of time;

power supply circuit means for self-holding the power conducting status to said signal processing unit upon the receipt of said command when the ignition key switch is opened, while holding the thus-stored data in said signal processing unit for a predetermined period of time of from 5 to 10 minutes even after the ignition key switch is opened; and

a power switch (SW) operatively cooperating with said power supply circuit means, said power switch being adapted to selectively forcibly release said power supply circuit means from the self-holding status thereof.

4,535,335

FIXED RANGE INDICATING SYSTEM FOR USE IN A VEHICLE TRAVEL PATH INDICATING APPARATUS

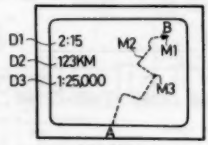
Katsutoshi Tagami; Tsuneo Takahashi, both of Saitama; Shinichiro Yasui, Tokyo, and Masao Sugimura, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 637,342

Claims priority, application Japan, Oct. 27, 1980, 55-150370

Int. Cl.[3] **G06F** *15/50*

U.S. Cl. 340—995 **1 Claim**



1. A fixed range indication system for use in a vehicle travel path indicating apparatus, comprising:

a pulse generator for generating a pulse at every moment when the travel distance of the vehicle increases by a predetermined first distance ("1");

counter means for counting said pulse;

a bearing detection unit for generating a bearing signal (θ) corresponding to the heading of the vehicle;

arithmetic operation means for receiving said bearing signal (θ), arithmetically obtaining a variation of the location of the vehicle on the two-dimensional coordinates from said first distance ("1") and said bearing signal (θ) at every moment when receiving said pulse, and accumulating said variation of location to obtain and output a locational data of the vehicle which is updated at every moment when receiving said pulse;

data extractor means for reading out the number registered in said counter to detect the travel distance of the vehicle and extracting the locational data from the outputs of said arithmetic operation means at every moment when the travel distance of the vehicle increases by a predetermined second distance (d) which is greater than said first distance ("1");

scale selector means for selecting one scale of the indication of the travel path from a plurality of predetermined scales of the indication and generating a selection signal indicating a selected scale;

data selector means for selecting the locational data from all of said extracted locational data at each rate predetermined in accordance with each said scale of the indication, the locational data selected for each said scale of the indication forming a data group, respectively, each said data group being discretely output from said data selector means;

data storing means including a plurality of data tables each adapted for storing one of said data groups and a storing system for storing each of said selected locational data in said data table as a data fraction in the manner of endless memory mode;

data reading means for reading out the number registered in said counter to detect the travel distance of the vehicle, receiving said selection signal, and reading out said data fraction from said memory table for said selected scale to output said data fraction at every moment when the travel distance of the vehicle increases by a fixed range predetermined in accordance with said selected scale, said fixed range being greater than said second distance (d);

data restoring means for restoring a locational data based on said data fraction output from said reading means; and

display means for receiving said restored locational data and indicating the vehicle travel path on a screen in accordance with said restored locational data.

4,535,336

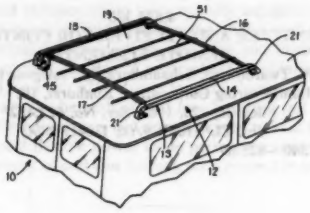
ANTENNA LUGGAGE RACK

Larry D. Shaver, 3312 Remington Dr., Plano, Tex. 75023

Filed Oct. 25, 1983, Ser. No. 545,402

Int. Cl.[3] **H01Q** *1/32*

U.S. Cl. 343—713 **4 Claims**



1. An antenna roof rack for a vehicle, comprising:

a rigid, rectangular, ringlike frame defined by right and left substantially parallel side rails rigidly joined together by front and rear cross rails which extend perpendicularly therebetween, said rails all being of metal;

stanchion means fixedly secured to said frame adjacent each of the four corners thereof and projecting downwardly therefrom for fixed attachment to the roof of a vehicle, said stanchion means maintaining said frame in upwardly spaced relationship from the vehicle roof, said stanchion means having insulator means associated therewith for insulating said frame from said roof;

said frame including bracket means at each of the corners thereof for providing a fixed connection between each side rail and the adjacent end of the respective cross rail, said bracket means at a first diametrically opposed pair of corners of said frame being of an electrically nonconductive material to effectively insulate the side and cross rails from one another at these corners, and said bracket means at the other pair of diametrically opposed corners of said frame being of an electrically conductive material to create an electrically conductive path between the connected side and cross rails at these latter corners; and

television transformer means connected to said frame adjacent one of the corners having said nonconductive bracket means associated therewith, said transformer means having a first conductive lead which is electrically connected to the respective side rail at said one corner in close proximity to the nonconductive bracket means, said transformer means having a second conductive lead which is electrically connected to the respective cross rail at said one corner in close proximity to said nonconductive bracket means;

the side rail which connects to said one corner and the remaining cross rail defining a first long conductive path, and the cross rail which connects to said one corner and the remaining side rail defining a second long conductive path, said first and second paths being of substantially the same length.

4,535,337

CROSS POLARIZED WIRE GRID ANTENNA

David H. MacAnlis, Rte. 2, Box 282A4, Berryville, Va. 22611

Filed Aug. 30, 1983, Ser. No. 527,723

Int. Cl.[3] **H01Q** *11/04*

U.S. Cl. 343—737 **17 Claims**

1. A cross polarized wire grid antenna producing electromagnetic radiation of circular polarization, said radiation hav-

ing a wavelength λ substantially at a center frequency of operation of said antenna, said antenna comprising:

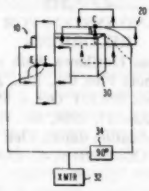
a first subarray of radiating elements, comprising

a first layer of conductors arranged to form a grid of first rectangular elements, the long sides of which operate essentially as transmission line elements and the short sides of which operate essentially as radiating elements for producing electromagnetic radiation of a first linear polarization, and

a second layer of conductors arranged to form a grid of second rectangular elements, the long sides of which operate essentially as transmission line elements and the short sides of which operate essentially as radiating elements for producing electromagnetic radiation of said first linear polarization,

said first layer being displaced ¼λ with respect to said second layer in a direction perpendicular to the direction of said first polarization;

a second subarray of radiating elements, parallel to said first



subarray and rotated 90° with respect to said first subarray, and comprising

a third layer of conductors arranged to form a grid of third rectangular elements, the long sides of which operate essentially as transmission line elements and the short sides of which operate essentially as radiating elements for producing electromagnetic radiation of a second linear polarization at an angle of 90° relative to said first linear polarization, and

a fourth layer of conductors arranged to form a grid of fourth rectangular elements, the long sides of which operate essentially as transmission line elements and the short sides of which operate essentially as radiating elements for producing electromagnetic radiation of said second linear polarization,

said third layer being displaced ¼λ with respect to said fourth layer in a direction perpendicular to the direction of said second polarization; and

means for feeding electrical current to said first subarray and said second array.

4,535,338

MULTIBEAM ANTENNA ARRANGEMENT

Edward A. Ohm, Holmdel, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

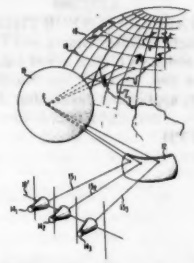
Filed May 10, 1982, Ser. No. 376,604
Int. Cl.³ H01Q *15/16, 19/19*
U.S. Cl. 343—781 CA **5 Claims**

1. A multibeam antenna arrangement comprising:

a main focusing reflector comprising a predetermined sized reflecting surface and far field of view;

a subreflector disposed confocally with the main reflector along a feed axis of the antenna arrangement, the subreflector being curved in orthogonal directions by separate predetermined amounts for transforming a predetermined three-dimensional non-rectangular matrix in the far field of view of the main reflector into a substantially rectangular matrix image of the far field of view on a focal surface of the antenna arrangement; and

a plurality of feeds disposed at predetermined separate locations on the substantially rectangular matrix image of the



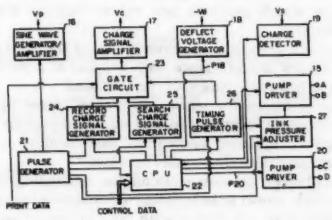
far-field of view on the focal surface of the antenna arrangement and aimed at the subreflector.

4,535,339

DEFLECTION CONTROL TYPE INK JET RECORDER

Masanori Horike, Tokyo; Tatsuya Furukawa, Yokohama; Yutaka Ebi, Kawasaki, and Hiroshi Yamazaki, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 525,390
Claims priority, application Japan, Sep. 1, 1982, 57-151930
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **6 Claims**



1. A deflection control type ink jet recording apparatus having an ink ejection head equipped with an ink ejection nozzle and a vibrator for applying pressure oscillation having a predetermined period to ink in an ink chamber, which communicates to the ink ejection nozzle, a pump for supplying ink under pressure to the ink ejection head, a charging electrode for applying a charging electric field to ink ejected from the nozzle, charge voltage generator means for applying a charge voltage to the charging electrode, and a deflection electrode for applying a deflecting electric filed to charged ink drops, said apparatus comprising:

means for detecting arrival of a charged ink drop, said means being located in an ink flight path or neighborhood thereof, said ink flight path extending from the charging electrode to a recording sheet;

electric circuit means connected to said charged ink drop arrival detecting means for generating a signal indicative of arrival of a charged ink drop;

charge voltage generator means for generating a charge voltage for controlling an ink pressure;

sync means for synchronizing the charge signal for ink pressure control to a pump drive signal; and

ink pressure adjuster means for supplying a pump drive circuit, which drives the pump, an ink pressure command signal which is based on a period from an instant of charging of an ink drop in response to the ink pressure control charge signal to an instant of detection of the charged ink

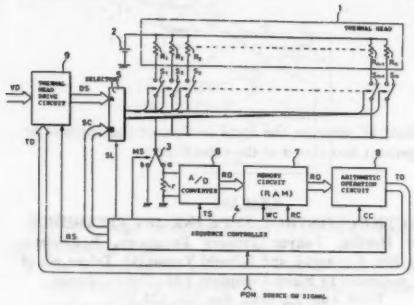
drop, starting from a point where the ink pressure control charge signal appears.

4,535,340

METHOD AND APPARATUS FOR THERMAL PRINTING

Haruhiko Moriguchi; Takashi Omori, and Toshiharu Inui, all of Ebina, Japan, assignors to Fuji Xerox Co. Ltd., Tokyo, Japan

Filed Jun. 13, 1984, Ser. No. 620,258
Claims priority, application Japan, Jun. 21, 1983, 58-111474
Int. Cl.³ H05B *3/00*
U.S. Cl. 346—76 PH **10 Claims**



6. Thermal printing apparatus comprising:

a thermal head including a plurality of heat generating resistors which generate heat when supplied with electric power;

means for detecting resistance values of said heat generating resistors in accordance with a signal at a predetermined time before driving said thermal head;

memory means for storing resistance values of said heat generating resistors detected by said detecting means;

means for updating contents of said memory means each time said detecting means operates;

an arithmetic operating circuit for calculating quantity of electric power to be supplied to respective heat generating resistors in accordance with the contents of said memory means; and

a thermal head drive circuit for selecting one of said heat generating resistors to be operated in accordance with a picture information supplied to said thermal printing apparatus;

said thermal head drive circuit supplying to said selected one of said heat generating resistors electric power of a quantity calculated by said arithmetic operating circuit.

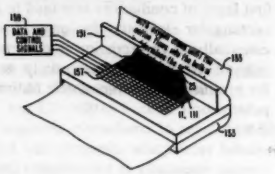
4,535,341

THIN FILM ELECTROLUMINESCENT LINE ARRAY EMITTER AND PRINTER

Zoltan K. Kun, and Paul R. Malmberg, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 19, 1983, Ser. No. 524,807
Int. Cl.³ B60Q *1/00*; H05B *37/00*
U.S. Cl. 346—107 R **21 Claims**

15. In combination with a printer means including a thin film electroluminescent drive circuitry for providing excitation voltage, and a paper drive means; a thin film electroluminescent line array emitter structure comprising a common electrode, a first dielectric layer disposed on said common electrode, a second dielectric layer, a phosphor layer disposed between said first and second dielectric layer, and a plurality of control electrodes disposed on said second dielectric electrode and defining thereby a plurality of pixels; said emitter structure having a first and a second face generally defined by said common and control electrodes respectively and an emitting edge generally perpendicular to said first and second faces, said emitting edge being defined by said plurality of pixels wherein said drive circuitry voltage is addressed to the individual control electrodes and pixel areas of the line array and wherein the drive means moves the paper relative to the line array.

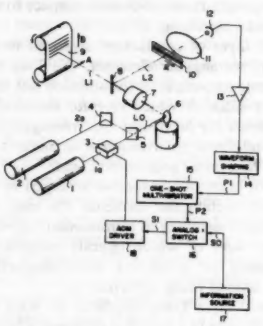


4,535,342

METHOD OF AND SYSTEM FOR LASER BEAM RECORDING

Yuji Ohara, and Kazuo Horikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 309,131, Oct. 6, 1981, abandoned. This application Jan. 17, 1984, Ser. No. 571,142
Claims priority, application Japan, Oct. 9, 1980, 55-141443
Int. Cl.³ G01D *9/42, 15/04*
U.S. Cl. 346—108 **3 Claims**

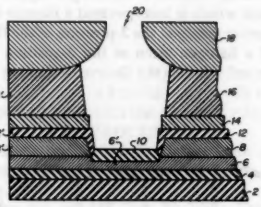


1. A laser beam recording system conprising an image signal generating means, a laser source, a light modulator for modulating a laser beam emitted from the laser source in accordance with the image signal generated by the image signal generating means, a photosensitive recording material capable of recording half tone images, means for causing the modulated laser beam to two-dimensionally scan the photosensitive recording material in a main and sub scanning directions, means for generating a position reference pulse in response to beam deflection each time the modulated laser beam moves along the photosensitive recording material by a predetermined constant distance in the main scanning direction, switch means for preventing transfer of the image signal to the light modulator for all but a predetermined constant time interval between adjacent position reference pulses; said means for preventing transfer of the image signal comprises an analog switch connected between said image signal generating means and said light modulator, and means connected between the analog switch and the means for generating the position reference pulses for closing the analog switch for said predetermined constant time interval between adjacent position reference pulses.

4,535,343
THERMAL INK JET PRINTHEAD WITH SELF-PASSIVATING ELEMENTS

Conrad L. Wright; James G. Bearrs; C. S. Chan; Robert R. Hay, all of Boise, Id., and Frank Ura, Woodside, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 31, 1983, Ser. No. 547,700
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—140 R 11 Claims

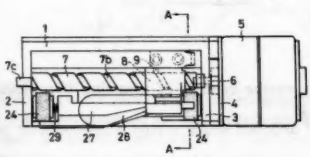


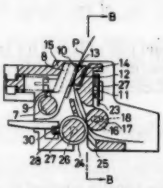
1. A thermal ink jet printhead assembly comprising a printhead support member, an orifice plate having at least one orifice therein, means for supporting said orifice plate on said support member, heating means formed of a resistive material capable of being anodized insulatingly disposed between said orifice plate and said support member and adjacent said orifice, electrically conductive means capable of being anodized in contact with said heating means, and passivating means disposed on said heating means and said conductive means, said passivating means comprising respectfully different compounds of said resistive material and said conductive means being formed in situ from and integral with said heating means and said conductive means.

4,535,344
RECORDING APPARATUS

Atsushi Noda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1983, Ser. No. 487,087
Claims priority, application Japan, Apr. 28, 1982, 57-70495
Int. Cl.³ G01D *15/24;* B41J *19/50*
U.S. Cl. 346—139 D 4 Claims





1. A recording apparatus operable in cooperation with recording paper, said apparatus comprising:

a recording head for recording a series of records on a recording paper;

means for generating a rotational force;

feed means having an axis and being coupled to said recording head and to said rotational force generating means, said feed means being driven by said rotational force generating means for pivoted movement about the axis to shift the relative position of said recording head and said recording paper, said recording head being operable to record a series of records on the recording paper during shifting of the relative position of said recording head and paper;

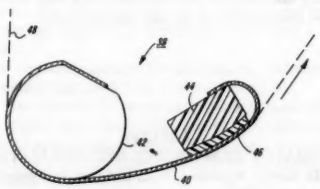
first holding means for holding said feed means respectively at a first bearing portion and a second bearing portion for said pivoted movement about the axis and for sliding movement in the direction of the axis; and

second holding means for holding said rotational force generating means, said second holding means being fixed to said first holding means and limiting the sliding movement of said feed means in one direction of the axis thereof.

4,535,345
ION PROJECTION PRINTER WITH EXTENDED BACK ELECTRODE

Jean K. Wilcox, El Granada, and Gene F. Day, Cupertino, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 20, 1983, Ser. No. 505,641
Int. Cl.³ G01D *15/06*
U.S. Cl. 346—159 1 Claim



1. An ion projection printing apparatus for printing on one side of a charge receptor sheet and comprising, sequentially, ion projection charging means, development means and fusing means and characterized by including

back electrode means for receiving the sheet in intimate, sliding, contact and positioned on the opposite side of the sheet from the charging means and development means and extending continuously from the charging means through the fusing means,

said back electrode means comprising an electrically conductive foil sheet along whose lateral dimensions thermal flow is inhibited,

the surface configuration of said foil sheet is defined by a support block to which said foil sheet is secured,

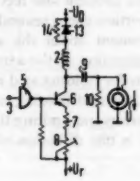
said support block defines a recess therein, within which a thermally insulating member is positioned, and

an electrically heated resistance blanket is sandwiched between said foil sheet and said thermally insulating member.

4,535,346
DRIVE CIRCUIT FOR PIEZOELECTRIC TRANSDUCER IN INK JET PRINTERS

Reiner Lichti, Germering, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 10, 1983, Ser. No. 493,317
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1982, 3223636
Int. Cl.³ G01D 15/16
U.S. Cl. 346—140 R 3 Claims



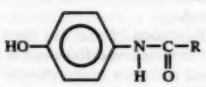
1. Apparatus for driving a piezoelictric transducer surrounding a fluid ink path in an ink jet printer, said transducer being adapted to expand upon application of a voltage poled opposite to the polarization direction of the transducer, and constricting in response to application of an oppositely poled voltage, including, in combination; a resonant circuit having a two-terminal inductor and a piezoelectric transducer functioning as a capacitance, means including a transistor having its collector conductively connected to said inductor for exciting said inductor directly by means of a current pulse having a predetermined duration flowing between its two terminals, the waveform of the voltage applied to said piezoelectric transducer being determined by the shape of said current pulse, and including a damping circuit connected in series with said inductor for damping the voltage waveform applied to said transducer, said damping beginning after a time interval delay relative to the beginning of oscillation of said resonant circuit initiated by said current pulse and damping said voltage waveform after the conclusion of said current pulse.

4,535,347
THERMALLY-RESPONSIVE RECORD MATERIAL

Kenneth D. Glanz, Appleton, Wis., assignor to Appleton Papers Inc., Appleton, Wis.

Filed May 7, 1984, Ser. No. 607,558
Int. Cl.³ B41M 5/18
U.S. Cl. 346—208 11 Claims

1. A thermally-responsive record material comprising a support member bearing a thermally-sensitive color-forming composition comprising chromogenic material and acidic developer material in contiguous relationship, whereby the melting or sublimation of either material produces a change in color by reaction between the two, one or more hydroxyanilide compounds represented by the formula:



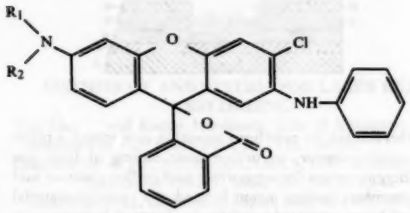
wherein R represents a straight or branched alkyl group of not more than 17 carbon atoms;
and a suitable binder therefor.

4,535,348
FLUORAN DERIVATIVES AND RECORDING MATERIAL USING SAME

Ken Iwakura, and Sadao Ishige, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 6, 1982, Ser. No. 395,237
Claims priority, application Japan, Jul. 6, 1981, 56-105416
Int. Cl.³ B41M 5/16, 5/18, 5/22
U.S. Cl. 346—221 4 Claims

1. A recording material comprising a support onto which is coated or into which is incorporated a fluoran derivative having an arylamino group at the 2-position of the fluoran skeleton thereof and a halogen atom at the 3-position of the fluoran skeleton thereof, wherein the fluoran derivative has the following Formula (II):



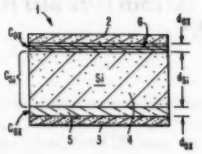
(II)

wherein R_1 and R_2, which may be the same or different, each represents an alkyl group having 2 to 9 carbon atoms, and the fluoran derivative forms a black image.

4,535,349
NON-VOLATILE MEMORY CELL USING A CRYSTALLINE STORAGE ELEMENT WITH CAPACITIVELY COUPLED SENSING

Zeev A. Weinberg, White Plains, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,477
Int. Cl.³ H01L 29/78; G11C 11/40
U.S. Cl. 357—23.6 4 Claims



1. A memory device capable of assuming two electrical states comprising:
- an element of undoped single crystal semiconductor material,
- a pair of silicon-rich, silicon dioxide layers disposed in insulated spaced relationship with each other disposed on one side of said element, one of said layers being contiguous with said element,
- means disposed over said pair of layers for applying voltages sufficient to inject carriers into or withdraw carriers from said element and sufficient to interrogate said states of said element,
- a layer of insulation disposed on the opposite side of said element, and,
- means responsive to an interrogation signal disposed on said layer of insulation electrically coupled to said element for sensing the motion of carriers in said element said memory device having one value of capacitance in the presence of

injected carriers and another value of capacitance in the absence of injected carriers.

4,535,350

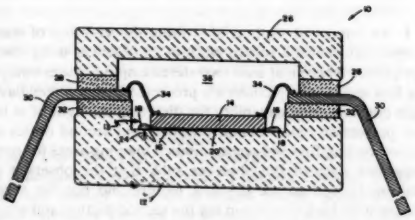
LOW-COST SEMICONDUCTOR DEVICE PACKAGE AND PROCESS

Gary B. Goodrich, and Jadish G. Belani, both of Cupertino, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 316,310, Oct. 29, 1981,. This application Jun. 29, 1984, Ser. No. 626,428

Int. Cl.[3] H01L *23/02, 39/02*

U.S. Cl. 357—74 6 Claims

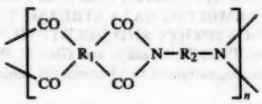


1. An hermetically sealcd semiconductor device package, which comprises:

a ceramic substrate,

a semiconductor die,

a body of cured polyimide resinous material cured from a composition containing a crosslinkable resinous polyimide precursor which will cure to give a polyimide having a recurring unit of the formula:



in which R_1 and R_2 are radicals of a tetravalent aromatic group and a divalent aromatic group, respectively, and n is a positive integer, a sufficient amount of an alkylaminotrialkoxysilane crosslinking agent to cure said resinous polyimide precursor, a sufficient amount of a finely divided conductive metal to render said composition conductive in the cured state and a polar organic solvent for said polyimide precursor and alkylaminotrialkoxysilane crosslinking agent, said body of cured polyimide resinous material containing the finely divided conductive metal, said body attaching said semiconductor die to said ceramic substrate, and

a closure covering said semiconductor die and said body of cured polyimide resinous material, said closure being in sealed relationship with said ceramic substrate, so that said closure, body of cured resinous material and ceramic substrate provide hermetic isolation for said semiconductor die.

4,535,351

SETTING-UP SYSTEM FOR A TELEVISION CAMERA

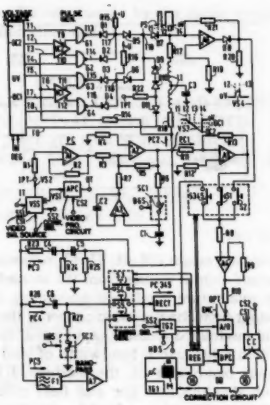
Frederik J. Van Roessel, Upper Saddle River, N.J., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1983, Ser. No. 456,942

Claims priority, application Netherlands, Jan. 22, 1982, 8200234

Int. Cl.[3] H04N *9/62*

U.S. Cl. 358—10 12 Claims



1. A system for establishing the parameters for a television camera which produces a video signal, comprising:

a signal processing circuit including a plurality of parallel signal channels, each of said channels having a different signal transfer characteristic;

a microcomputer having a memory with separate storage locations for storing digital correction values corresponding to minimum error values of distinct sub areas of a television video signal;

a digital error measuring circuit for determining error values between the average value of a video signal taken over distinct sub areas of a television picture and a reference value;

a signal correction circuit for substituting said stored digital correction values in said video signal; and

means for selectively connecting each of said channels to said digital error measuring circuit, whereby an error in each of said channels may be detected to indicate said stored correction values should be substituted in said television video signal.

4,535,352

TECHNIQUE FOR GENERATING SEMI-COMPATIBLE HIGH DEFINITION TELEVISION SIGNALS FOR TRANSMISSION OVER TWO CABLE TV CHANNELS

Barin G. Haskell, Tinton Falls, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 16, 1984, Ser. No. 600,805

Int. Cl.[3] H04N *9/38, 9/39, 9/42, 9/32*

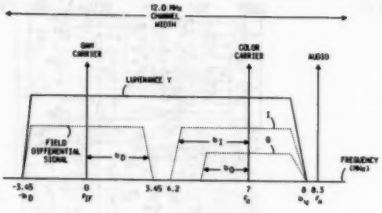
U.S. Cl. 358—16 14 Claims

1. An arrangement for generating a semi-compatible high-definition television (SC-HDTV) color picture signal including a predetermined bandwidth and format, the arrangement comprising:

first generating means (10-12) responsive to line signals of a HDTV color picture signal including luminance and chrominance components received at a first line scan rate for generating therefrom stretched color picture signals which include line signals at a second line scan rate that is both a submultiple of the first line scan rate and at a same

line scan rate as that of an associated conventional standard television system picture signal;

second generating means (15-25) responsive to a first and a second sequential line of a field of a stretched color picture signal at the output of the first generating means for generating therefrom a first output signal comprising the first line signal substantially as is, and a second output signal comprising the second line signal as a field differential signal; and



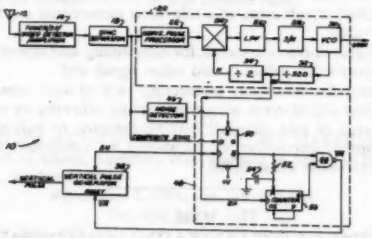
modulating means (40-41, 43-47) responsive to the first and second output signals from the second generating means for quadrature amplitude modulating (QAM) the second output signal on the video carrier of the first output singal, said modulated second output signal being disposed to lie within a luminance bandwidth of, and outside a chrominance bandwidth of, the modulated first output signal such that the first line and field differential signals lie within said predetermined bandwidth of the SC-HDTV color picture signal.

4,535,353

VERTICAL REFERENCE SIGNAL IDENTIFICATION SYSTEM

Rudolf Turner, Vernon Hills, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 18, 1984, Ser. No. 662,219
Int. Cl.[3] H04N *9/62*
U.S. Cl. 358—21 V **9 Claims**



1. Apparatus responsive to a composite video signal including a composite sync signal having horizontal and vertical sync components for generating a precise vertical reference signal comprising:

sync separation means responsive to the composite video signal for removing the composite sync signal therefrom;

signal processing means coupled to said sync separation means and responsive to the horizontal sync component of the composite sync signal for generating a sampling signal defining a plurality of sampling points occurring at twice the rate of the horizontal sync component and coincident with only the broad pulses of the vertical sync component of the composite sync signal; and

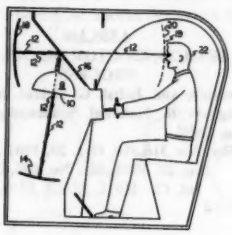
circuit means coupled to said sync separation means and to said signal processing means and sampling the composite sync signal in response to the sampling signal for generating a vertical reference signal upon the detection of a predetermined relationship between the sampling signal and the vertical sync component of said composite sync signal.

4,535,354

PROJECTED STEREOSCOPIC PICTURE SEPARATION

Glenn E. Rickert, 3429 W. 700 North, Huntington, Ind. 46750

Filed Mar. 24, 1983, Ser. No. 478,533
Int. Cl.[3] H04N *9/54*
U.S. Cl. 358—88 **20 Claims**



1. An improved method of limiting the visibility of stereoscopic pictures on a screen without an observer using special eye glasses wherein at least two stereoscopic pictures comprising first and second pictures are projected onto a screen having light concentrating capability for directing the light of at least two projection optics comprising first and second optics into corresponding first and second limited viewing areas for use by respective eyes of the observer such that the observer can position himself to see the first picture and not the second picture with his first eye and see the second picture and not the first picture with his second eye whereby he can see the picture as a three-dimensional display, the improvement comprising:

projecting the first picture onto said screen by means of said first projection optic and a beam splitter;

projecting the second picture onto said screen by means of said second projection optic and said beam splitter;

whereby a substantially distortion free three-dimensional display is provided the observer.

4,535,355

METHOD AND APPARATUS FOR SCRAMBLING AND UNSCRAMBLING DATA STREAMS USING ENCRYPTION AND DECRYPTION

Robert M. Arn; Peter H. Csanky, and Glen F. Waszek, all of Toronto, Canada, assignors to Microdesign Limited, Toronto, Canada

Filed Sep. 7, 1982, Ser. No. 415,317
Claims priority, application Canada, Jun. 23, 1982, 405818
Int. Cl.[3] H04N *7/16, 1/04*
U.S. Cl. 358—123 **28 Claims**

1. A method of scrambling and unscrambling a plurality of data streams having differing data on a plurality of signal channels, where each data stream has discrete and recognizable synchronizing information contained therein, which is periodically or aperiodically transmitted, and where there are at least as many signal channels, each having a fixed carrier frequency, as there are differing data streams to be scrambled and unscramble; comprising the steps of:

(a) synchronizing all of said plurality of data streams;

(b) generating an encryption key code and imposing said encryption key code onto said plurality of data streams;

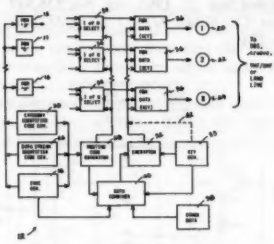
(c) generating a data package which contains an identifier code for each data stream and a routing code by which said plurality of data streams are routed at any instant of time, so that each said data stream is assigned at that

instant of time to a specific one of said plurality of signal channels;

(d) encrypting said data package in each of said data streams by inserting the same in said data stream at a specific place therein relative to said synchronizing information;

(e) transmitting said assigned routed data streams on their respective assigned signal channels;

(f) receiving said assigned routed data streams at any receiver equipped to receive and de-modulate the same;



(g) at any authorized receiver, capturing said encryption key code and utilizing said encryption key code to decrypt said encrypted data package so as to decode said identifier codes and said routing code; and

(h) utilizing said identifier codes and said routing codes so as to track a given data stream, no matter on which transmitted channel it appears at any instant of time.

4,535,356

MUSIC INFORMATION TRANSMISSION SYSTEM

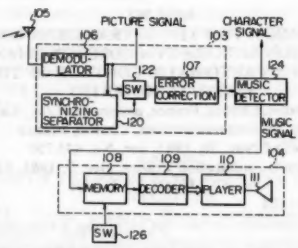
Koichi Nakagawa; Yoshio Sugimori; Yoshihide Kimata; Yosai Araki, and Tomoji Arai, all of Tokyo, Japan, assignors to Nippon Television Network Corporation; OKI Electric Industry Co., Ltd. and KEIO Electronic Laboratory Corporation, all of Tokyo, Japan

Filed Dec. 20, 1982, Ser. No. 451,552

Claims priority, application Japan, Dec. 28, 1981, 56-209647; Dec. 28, 1981, 56-209648

Int. Cl.³ H04N 7/04, 7/08

U.S. Cl. 358—145 **3 Claims**



1. A music information transmission system comprising:

input means having a keyboard for quantizing and modulating a music symbol representable on a music sheet into a digital signal by providing said symbol through said keyboard,

means for assembling said digital signal and a character signal into a packet which has a header portion and a data portion, said header portion having at least a music detector area for indicating that the data portion relates to music,

means for multiplexing said packet in a blanking period of a television signal,

means for transmitting said television signal,

reception means for receiving said television signal and separating said packet from a picture signal which is to be displayed on a screen,

means for separating from said packet said digital signal relating to said music symbol and said character signal,

memory means for storing temporarily said separated digital signal,

decoding means for reading out the content of said memory means and decoding the digitally encoded music symbol,

means for displaying characters in said packet on a screen, and

means for playing audio represented by the music symbols decoded by said decoding means.

4,535,357

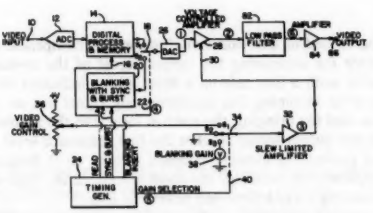
VIDEO SIGNAL PROCESSING CIRCUIT AND METHOD FOR BLANKING SIGNAL INSERTION WITH TRANSIENT DISTORTION SUPPRESSION

Bruce J. Penney, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 8, 1983, Ser. No. 483,321

Int. Cl.³ H04N 5/06

U.S. Cl. 358—150 **18 Claims**



1. A video signal processing circuit comprising:

video input means for supplying an input video signal;

blanking data means for generating a separate blanking data signal including blanking pulse and horizontal sync signal components;

signal insertion means for inserting said blanking data signal into said input video signal to provide a modified video signal; and

signal shaping means for shaping a portion of the modified video signal to reduce the slopes of the front and rear edges of the blanking pulse portion to provide a shaped video signal, and to enable the transmission of the shaped video signal through a low pass filter to provide an output video signal and to suppress transient distortion of said output video signal.

4,535,358

LINE SYNCHRONIZING CIRCUIT FOR A PICTURE DISPLAY DEVICES AND PICTURE DISPLAY DEVICE COMPRISING SUCH A CIRCUIT

Peter A. Duijkers, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 7, 1983, Ser. No. 483,084

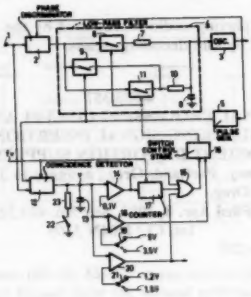
Claims priority, application Netherlands, Apr. 13, 1982, 8201531

Int. Cl.³ H03L 7/00; H04N 5/04

U.S. Cl. 358—158 **12 Claims**

1. A line synchronizing circuit for a picture display device, comprising a control loop for controlling the frequency and/or the phase of a line oscillator, said control loop including means for applying an incoming line synchronizing signal and a reference signal generated by the oscillator to a phase discriminator for determining the phase difference between the applied signals, and a low-pass filter for smoothing the output signal of the phase discriminator and for applying the smoothed output signal to the oscillator for controlling this oscillator, the circuit

also comprising a coincidence detector for determining the phase difference between the incoming line synchronizing signal and the reference signal, and means coupled to said coincidence detector for switching elements of the control loop when said phase difference is less than a predetermined value for bringing the loop from a first into a second state, respectively, in which second state the loop gain and the pull in rate, respectively, have a higher value than in the first state,



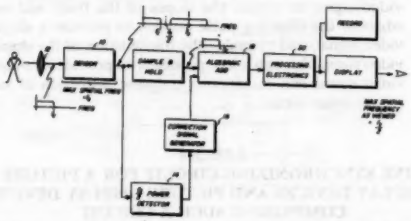
characterized in that said switching means comprises: a level detector for comparing the output signal of the coincidence detector with a first reference level which indicates the presence of an incoming line synchronizing signal but no coincidence, and for bringing the control loop into the second state until said output signal reaches the first reference level, and a signal prolonging element coupled to said level detector for subsequently maintaining the control loop in the said second state during a predetermined period of time.

4,535,359

DEFECT CORRECTION IN SOLID STATE IMAGING

William T. Fearnside, Fishers, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,497
Int. Cl.³ H04N *5/14, 3/14*
U.S. Cl. 358—163 **7 Claims**



1. Apparatus for use with an electrooptic imager adapted to receive and sample an optical image at a given sampling frequency, thereby to produce a composite signal comprised of a baseband signal and sidebands of said sampling frequency, comprising:

(a) means for limiting the optical spatial frequency bandwidth of any optical image cast upon said imager to a frequency that is less than one-half the sampling frequency of said imager,

(b) means for receiving said composite signal for detecting electrical power having a frequency that approximates or equals one-half said sampling frequency, thereby to register the existence of at least one defective pixel of said imager, and

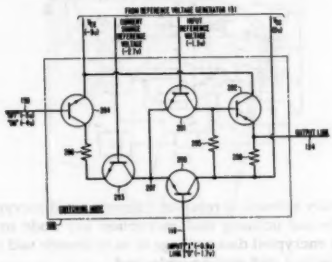
(c) means for modifying said baseband signal in proportion to the magnitude of said electrical power and in accordance with the phase thereof.

4,535,360

LOW POWER WIDEBAND SWITCHING ARRAY ELEMENT

Bruce E. Briley, Countryside, and Jeffrey A. Hiltner, Winfield, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 27, 1983, Ser. No. 536,947
Int. Cl.³ H04N *5/22, 1/00, 5/68, 5/64*
U.S. Cl. 358—181 **6 Claims**



1. A switching device comprising a pair of transistors each having a base, an emitter, and a collector, and configured as an emitter-coupled pair for the communication of video signals from said base of one of said pair of transistors to said collector of another one of said pair of transistors, a transistor current source having an emitter and a collector and having its collector connected to said emitters of said pair of transistors, a resistor connected with said emitter of said current source, a transistor switch serially connected to said resistor and said emitter of said current source and responsive to a receipt of an enable signal to allow current to flow through said resistor for enabling said pair of transistors to communicate said video signals and further responsive to a receipt of a disable signal for inhibiting the flow of current through said resistor thereby inhibiting the communication of said video signals and dissipation of power by said pair of transistors.

4,535,361

EQUIPMENT FOR THE RETRANSMISSION OF TELEVISION SIGNALS IN A COMMON CHANNEL, WITH AN AUTOMATIC CONTROL OF THE VIDEO/AUDIO RATIO

Jean Yves Corbel, Chatou, France, assignor to LGT, Laboratoire General des Telecommunications, Chatou, France

Filed Nov. 30, 1982, Ser. No. 445,750
Claims priority, application France, Dec. 7, 1981, 81 22854
Int. Cl.³ H04N *5/62, 7/04*
U.S. Cl. 358—184 **3 Claims**

1. A retransmission device for receiving a television signal and retransmitting a corrected television signal, comprising:

first mixing means for receiving said television signal and a first local signal and for translating said television signal into an intermediate frequency signal having video and audio components;

automatic control circuit means coupled to said first mixer and for controlling the video/audio ratio between said video and audio components, said automatic control circuit including,

(a) a power distributor having two outputs, for dividing the power at its input between said two outputs,

(b) an audio filter having an input connected to one of said power distributor outputs, for filtering said intermediate frequency audio component signal,

(c) a video filter having an input connected to the other one

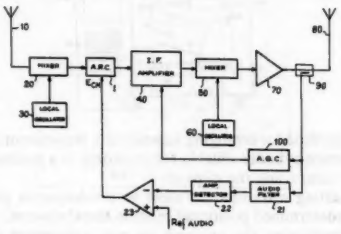
of said power distributor outputs, for filtering said intermediate frequency video component signal,

(d) audio sampling means having an input connected to the output of said audio filter, a main output and an auxiliary output, for sampling said intermediate frequency audio component signal,

(e) video sampling means having an input connected to the output of said video filter, a main output and an auxiliary output, for sampling said intermediate frequency video component signal,

(f) first and second detecting means, respectively, connected to said auxiliary outputs of said audio and video sampling means, for respectively detecting the peak amplitude of said intermediate frequency signal audio and video components,

(g) adding means connected to said main outputs of said audio and video sampling means for outputting said corrected television signal to be retransmitted,



(h) comparing means connected to the outputs of said first and second detecting means for determining whether the video/audio ratio is equivalent to greater than or lesser than a predetermined ratio and outputting a corresponding comparison signal, said video filter and said video sampling means forming a video channel and said audio filter and said audio sampling means forming an audio channel, and

(i) a variable gain amplifier connected in any one of said video and audio channels, between said respective filter and sampling means, and having a control input connected to the output of said comparing means, the gain of said variable gain amplifier being adjusted in accordance with said comparison signal;

an amplifier coupled to said automatic control circuit;

a second mixer coupled to said amplifier, for translating the output signal from said amplifier into high frequency; and

transmitting means coupled to said second mixer for transmitting said high frequency output signal from said second mixer.

4,535,362

METHOD OF TRANSFERRING DATA IN A TELEVISION RECEIVER

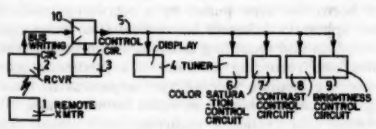
Guy J. C. Gerot, Nanterre, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1983, Ser. No. 465,935

Claims priority, application France, Mar. 24, 1982, 82 05009

Int. Cl.³ H04N *5/44*

U.S. Cl. 358—194.1 **4 Claims**



1. A method for use in a control system of a television receiver for transferring messages from a control circuit to several circuits to be controlled, said television receiver generating a sequence of line retrace pulses and field synchronizing pulses as timing signals for said control system, said messages being digitally encoded and being transferred serially over a single-wire line, characterized in that said method comprises the steps:

detecting said sequence of line retrace pulses and field synchronizing pulses;

digitally encoding said messages such that in each encoded message at least one bit thereof is significant and defines which one of said several circuits is to be controlled thereby; and

forming a sequence from said encoded messages having a fixed number of significant bits which all occur in a time interval located between two consecutive field synchronizing pulses in said sequence of line retrace pulses and field synchronization pulses, said messages being arranged in said sequence such that the significant bits therein correspond ordinally with the line retrace pulses in said sequence of line retrace pulses and field synchronizin pulses.

4,535,363

ELECTRONIC IMAGE SENSING APPARATUS

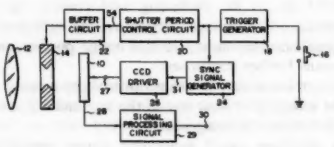
Nozomu Harada, and Okio Yoshida, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 23, 1983, Ser. No. 478,104

Claims priority, application Japan, Mar. 31, 1982, 57-51418

Int. Cl.³ H04N *3/14*

U.S. Cl. 358—213 **9 Claims**



1. An electronic image sensing apparatus for photographing a scene image to produce a still image of the photographed scene, said apparatus comprising:

(a) a solid state image sensing element having a photosensitive section containing a plurality of photosensitive cells and a charge readout section, which receives incident image light to generate and store signal charges corresponding to the image light in said photosensitive section, and simultaneously transfers said signal charges to said charge readout section to read out the signal charges during a signal charge readout period, and responds to the image light coming in after the readout of said signal charge to generate and store signal charges again;

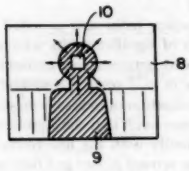
(b) shutter means for opening at a proper shutter speed so as to irradiate the image light to said solid state image sensing element; and

(c) control means connected to said solid state image sensing element and said shutter means, for driving said shutter means so that said shutter means opens before and after the signal charge readout period in synchronism with the signal charge readout operation of said image sensing element.

4,535,364
SPOT EXPOSURE ADJUSTMENT CIRCUIT

Hitoshi Hirobe, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 320,029
Claims priority, application Japan, Nov. 13, 1980, 55-159898
Int. Cl.³ H04N 5/193
U.S. Cl. 358—228 2 Claims



1. In a television camera of the type having an image pickup element for converting the image of an object to be photographed into electrical signals, an exposure control apparatus having a voltage detector and controlling the exposure of said image according to the voltage level of said electrical signals, the improvement comprising:

spot selection means for providing to said exposure control apparatus electrical signals corresponding to a portion of said image less than the entire image, whereby the exposure of said entire image is controlled in accordance with the detected voltage levels of said electrical signals corresponding to a portion of said image and further comprising a switch for receiving said electrical signals corresponding to said image and passing said electrical signs to its output in response to a control signal; and

control means for providing said control signal to said switch only during reception by said switch of electrical signals corresponding to said image portion; said control means further comprises:

spot portion selection means operable by a camera operator for selecting at least one of the size and a position of said portion of said image; and

spot selection signal generating means responsive to an output from said spot position selection means for providing said control signal to said switch; wherein said spot position selection means provides an output signal defining first, second, third and fourth voltage levels, and wherein said spot selection signal generating means comprises:

a first waveform generating circuit for generating a first signal having a voltage level which changes over the course of a vertical image scan, whereby the value of said first signal represents a vertical position of said image;

a second waveform generating circuit for generating a second signal having a voltage level which changes over the course of a horizontal image scan whereby the value of said second signal represents a horizontal position of said image;

first comparator means for providing an output signal when said first signal is between said first and second voltages;

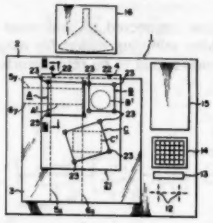
second comparator means for providing an output signal when said second signal is between said third and fourth voltages; and

means for providing said control signal to said switch during the simultaneous occurrence of output signals from both of said first and second comparator means.

4,535,365
METHOD AND APPARATUS FOR POSITIONING ORIGINAL PICTURES INTO A TRANSPARENT SHEET TO BE MOUNTED TO A PICTURE CYLINDER OF A PICTURE REPRODUCING MACHINE

Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 29, 1982, Ser. No. 427,292
Claims priority, application Japan, Sep. 29, 1981, 56-153065; Sep. 29, 1981, 56-153066
Int. Cl.³ H04N 1/18
U.S. Cl. 358—287 12 Claims



1. A method for arranging substantially transparent originals on a picture cylinder suitable for recording in a predetermined layout, comprising the steps of:

(A) setting a transparent sheet to a transparent plate at a predetermined positional relation therebetween,

(B) positioning the originals on said transparent sheet by using X and Y cursors so that orientations of parts to be reproduced of originals are respectively consistent with those of reproduction images,

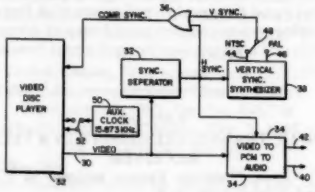
(C) fixing said originals on said transparent sheet at respective positions positional in said step (B),

(D) mounting said transparent sheet onto the picture cylinder.

4,535,366
UNIVERSAL VIDEO DATA PLAYBACK

Alan J. Pullen, Canoga Park, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Feb. 22, 1982, Ser. No. 350,858
Int. Cl.³ H04N 5/76, 7/08
U.S. Cl. 358—342 6 Claims



1. A method for recovering, at a predetermined rate, encoded digital data signals from a recording medium having said data recorded thereon in contiguous segments which alternate with cyclically recurring pulse signals recoverable as video level horizontal sync pulses by a recording medium video player apparatus, wherein no vertical sync pulse signals are recorded on said recording medium, comprising the steps of:

playing said recording medium on a predetermined format recording medium video player apparatus to recover the signals recorded thereon as video format signals;

separating said cyclically recurring pulse signals from said recovered signals;

synthesizing from said separated pulse signals, vertical pulse signals having a repetition rate, relative to said separated

pulses, equal to the repetition rate of vertical sync pulses relative to horizontal sync pulses in said predetermined format;

providing said vertical sync pulses to the circuitry in said player apparatus which normally utilize, when recorded video is played, the separated vertical sync pulses from the recovered video; and

decoding the recovered video format signals into digital data signals.

4,535,367

MAGNETIC RECORD STILL MODE REPRODUCTION APPARATUS AND METHOD

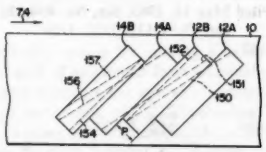
Shuhei Kanda, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 293,939, Aug. 18, 1981, abandoned. This application Dec. 21, 1983, Ser. No. 563,547

Claims priority, application Japan, Aug. 28, 1980, 55-118741

Int. Cl.[3] H04N *5/783*

U.S. Cl. 360—10.2 **29 Claims**



1. A helical scanning type recording and/or reproduction apparatus which effects a slow motion reproduction consisting of a still reproduction period and a normal reproduction period, said apparatus comprising:

(a) speed control means for controlling travel of a recording medium in such a way that said recording medium runs at a prescribed constant normal speed in a normal recording-/reproduction mode and runs in a slow motion reproduction mode alternately between said normal speed and a still condition substantially corresponding to still reproduction;

(b) a first pair of head means for normal mode recording and reproduction having different azimuth angles from each other and having the same head width, said first pair of head means for defining, at a predetermined pitch on the recording medium, a plurality of video tracks on which field image signals are magnetically recorded, neighboring ones of said tracks having different azimuth angles from one other;

(c) a second pair of head means for special mode reproduction, said second pair of head means each having the azimuth angle of the same one of said first pair of head means, for reproducing the image signals recorded on the video tracks having the same azimuth angles as those of said second pair of head means, said second pair of head means having the same head width as that of said first pair of head means;

(d) head-supporting means, defining first and second parallel circumferential lines spaced from each other by a prescribed distance d which is greater than zero but less than one pitch of said video tracks, for (i) supporting said first pairs of heads means in such a manner that each head of said first pair of head means is diametrically positioned with respect to the other and aligned with said first circumferential line, and (ii) supporting said second pair of head means in such a manner that each head of said second pair of head means is diametrically positioned with respect to the other, wherein one head of said second pair of head means is aligned with said first circumferential line and the other head of said second pair of head means is aligned with said second circumferential line so that said one head and said other head of said second pair of head means are spaced apart by said distance d; and

(e) rotating means, operatively connected to said supporting means, for, (i) in the still reproduction period included in said slow motion reproduction, causing said second pair of head means to trace an aimed video track during said still condition having an azimuth angle equal to that of said second pair of head means, said aimed track including first and second paths spaced from one other by said predetermined distance d and inclined with respect to said aimed video track, thereby increasing the tracing area of said aimed video track traced by said second pair of head means, and for, (ii) in the subsequent normal reproduction period included in said slow motion reproduction, causing one of said second pair of head means to slide on said aimed video track along a third path parallel to said aimed video track having substantially the same width as the head of said second pair of head means and a tracing deviation width smaller than the half of the width of said aimed video track, thereby maximizing the image signal level reproduced during the still reproduction period during said normal reproduction period included in said slow motion reproduction.

4,535,368

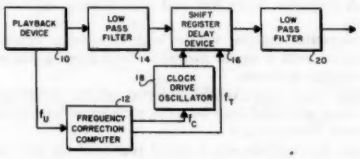
WOW AND FLUTTER CONTROL APPARATUS FOR AUDIO AND VIDEO PLAYBACK SYSTEMS

Jack Schwartz, and Tai T. Wu, both of 147 Ridge St., Arlington, Mass. 02174

Filed Jun. 1, 1983, Ser. No. 499,981

Int. Cl.[3] G11B *5/02*

U.S. Cl. 360—28 **9 Claims**



1. Apparatus for correcting instantaneous frequency deviation in the output signal of a playback device, said apparatus comprising

means for providing a constant frequency signal at the output of said playback device in addition to the normal recorded program material to be reproduced by said playback device;

a frequency to voltage converter having an input coupled to said playback device, adapted to receive said constant frequency signal as reproduced by said playback device, and operating to produce an output voltage proportional to the frequency of the input signal;

a voltage averaging means having an input coupled to the output of said frequency to voltage converter and operating to average the input signal over a predetermined time period and produce an output signal representing said constant frequency signal as originally provided;

means coupled to the output of said frequency to voltage converter and to the output of said voltage averaging means for comparing the outputs thereof and producing an output voltage proportional to the frequency of a control signal required to correct said instantaneous frequency deviations in the output of said playback device;

a first voltage to frequency converter coupled to the output of said comparing means and operating to produce a first control signal;

a delay device coupled to the output of said playback device and adapted to receive signals representing the normal recorded program material as reproduced by said playback device, said delay device having a clock drive

adapted to be driven by a control signal of variable frequency and coupled to the output of said first voltage to frequency converter;

whereby the signals representing the normal recorded program material as reproduced by said playback device are selectively delayed by a time proportional to the frequency of said first control signal to thereby substantially correct said instantaneous frequency deviations in the output of said playback device.

4,535,369

MAGNETIC RECORDING AND REPRODUCING APPARATUS

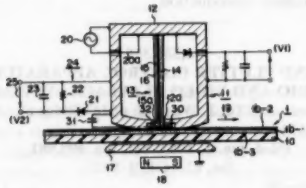
Norikazu Sawazaki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation-in-part of Ser. No. 513,386, Jul. 13, 1983,. This application Nov. 16, 1983, Ser. No. 552,390

Claims priority, application Japan, Jul. 16, 1982, 57-122942; Jul. 16, 1982, 57-122943; Nov. 9, 1982, 57-196377; Nov. 18, 1982, 57-202283

Int. Cl.³ G11B *5/02*

U.S. Cl. 360—55 **9 Claims**



1. A magnetic recording and reproducing apparatus comprising:

a magnetic material whose high frequency characteristic varies with a signal magnetic field from a magnetic recording medium;

a high frequency coupling circuit whose coupling degree varies with said high frequency characteristic of the magnetic material; and

means for reproducing a signal recorded on said magnetic recoding medium in accordance with the variation of the coupling degree of said high frequency coupling circuit.

4,535,370

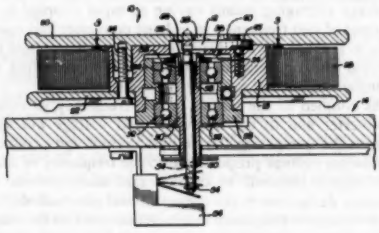
MAGNETIC TAPE REEL WRITE PROTECT MECHANISM

William J. Gervais, Northridge, Calif., assignor to Rosstream Research Assoc. Ltd., Cerritos, Calif.

Filed Dec. 22, 1982, Ser. No. 452,335

Int. Cl.³ G11B *15/04*

U.S. Cl. 360—60 **9 Claims**



1. A mechanism to reduce the risk of inadvertent erasure or over-writing of a magnetic tape, said mechanism comprising:

a tape reel having a front flange and a rear flange;

switching means incorporated into said front flange and operable from the front face thereof, for switching the status of said reel between protected and unprotected conditions, such switching means including an actuator rotatable from the front face of said front flange, about an axis eccentric to the axis of rotation of said reel, and rotatable between first and second angular positions; and

sensing means located on the axis of rotation of said reel, for sensing the status of said switching means, said sensing means including a rod mounted for limited axial movement along the axis of rotation of said reel and biasing means for urging said rod toward an extended position, wherein said actuator presents a camming surface toward an end of said rod, and is operative to move said rod axially between extended and retracted positions as said actuator is rotated between its two angular positions.

4,535,371

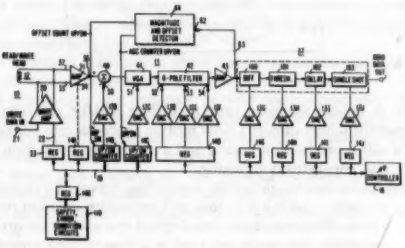
RECORDING CHANNEL WITH SIGNAL CONTROLLED INTEGRATED ANALOG CIRCUITS

Jerome D. Harr, San Jose, and Karl R. Hense, Los Altos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 16, 1983, Ser. No. 494,822

Int. Cl.³ G11B *5/02, 5/09*

U.S. Cl. 360—67 **14 Claims**



1. A recording channel for a data storage file including means for converting the signal in the read transducer to a binary digital signal having a value which corresponds to the value of stored data that produced said signal, said converting means comprising:

a plurality of integrated circuits including

(1) a read amplifier having its input connected to said read transducer;

(2) a peak detector including an input terminal, a first set of interconnected analog circuits and a digital output circuit to provide said binary digital signal, and at least one control terminal for each of said circuits of said peak detector to permit the adjustment of an operating parameter of each said circuit of said peak detector in accordance with a control signal supplied to said at least one control terminal; and

(3) circuit means including

(a) a second set of analog circuits connected betwen said read amplifier and said input terminal of said peak detector to

(i) maintain the amplitude of said signal supplied to said peak detector at a predetermined amplitude independent of the output of said read amplifier; and

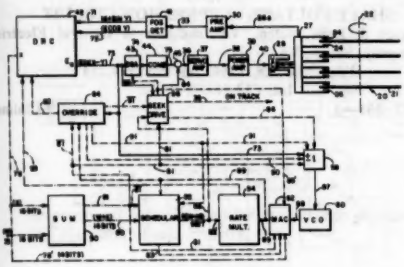
(ii) eliminate any DC component present in the signal supplied from said read amplifier; and

(b) means for dynamically and continuously adjusting preselected parameters of said second set of analog circuits, including means for developing control signals for said second set of analog circuits in accordance with the signal supplied to said peak detector.

4,535,372
POSITION TRACKING SERVO CONTROL SYSTEMS AND METHODS

Lester M. Yeakley, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Jun. 29, 1983, Ser. No. 509,238
Int. Cl.³ G11B 5/55, 5/58
U.S. Cl. 360—77 **58 Claims**



1. In a positioning system for moving a movable member along a defined path of movement from an initial position to a final position and including the movable member having the defined path of movement, means for dividing the path of movement into a series of contiguous segments, actuator means coupled to the movable member for moving said movable member, a control system comprising:

reference position means for storing a reference position of the movable member with respect to the path of movement, the stored reference position being variable, indicating an approximate position of the movable member with respect to the segments along the path of movement including an approximate incremental position with respect to a segment and initially indicating said initial position;

position means for generating an indication of actual incremental position of the movable member with respect to a segment;

controller means responsive to said position means and to said reference position means for generating a position error value having a magnitude indicating a difference between said approximate incremental position and said actual incremental position;

means for controlling said actuator means in response to said position error value; and

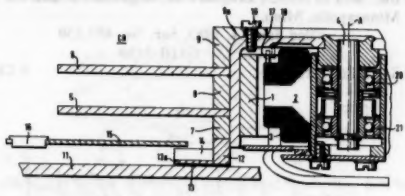
updating means responsive to a command indicating a final position of the member for incrementing the stored reference position from said initial position to said final position.

4,535,373
LABYRINTH SEAL IN DISK STORAGE DRIVE

Bernhard Schuh, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 127,404, Mar. 5, 1980, abandoned. This application Dec. 29, 1981, Ser. No. 335,483
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 3049334
Int. Cl.³ G11B 5/012
U.S. Cl. 360—97 **25 Claims**

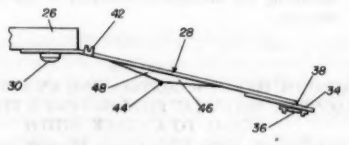
1. In a disk storage drive having a chamber of contaminant-free environment without provision of air intake, a combination comprising at least one storage disk mounted for rotation in said chamber; a DC brushless electric motor having a stator and a rotor to drive said disk; means connecting said disk to said rotor for rotation with the same; and a labyrinth seal defined by an airgap between portions of said stator and said rotor and located to substantially stop the movement of contaminent particles from the inside of the motor to the contaminent-free chamber.



4,535,374
WHITNEY-TYPE HEAD LOADING/UNLOADING APPARATUS

Kurt M. Anderson, Louisville, and James H. Morehouse, Jamestown, both of Colo., assignors to Amcodyne Incorporated, Longmont, Colo.

Filed Nov. 4, 1982, Ser. No. 439,190
Int. Cl.³ G11B 5/60, 15/64, 17/32
U.S. Cl. 360—103 **6 Claims**



1. In an apparatus for positioning a head relative to a magnetic disk for translating data during read/write operations, an assembly comprising:

a Whitney-size head, said Whitney-size head being spaced from the disk during the positioning of said Whitney-size head for read/write operations;

a Whitney-type flexure to which said Whitney-size head is supportably connected;

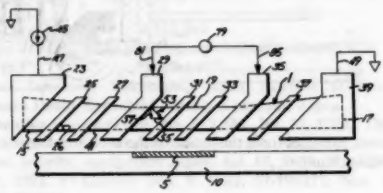
a substantially triangular-shaped Whitney-type suspension arm having a longitudinal axis, said Whitney-type suspension arm being sent about an axis that perpendicularly intersects said longitudinal axis of said Whitney-type suspension arm; and

dynamic loading means, operatively associated with said Whitney-type suspension arm, said dynamic loading means including a cooperating portion and a ramp-like member for use in positioning said Whitney-size head relative to the magnetic disk for data translation therewith, wherein said cooperating portion and said ramp-like member provide for simultaneous horizontal and vertical movement of said Whitney-size head relative to the disk as said cooperating portion and said ramp-like member movingly engage each other, said moving engagement between said cooperating portion and said ramp-like member being along the gravitational center line of the combination of said Whitney-type suspension arm, said Whitney-type flexure, and said Whitney-size head to minimize unwanted movement of the Whitney-size head during positioning thereof relative to the magnetic disk.

4,535,375
MAGNETORESISTIVE HEAD

Gregory S Mowry, Burnsville, and Peter K. George, Bloomington, both of Minn., assignors to Magnetic Peripherals, Inc., Minneapolis, Minn.

Filed Jan. 14, 1983, Ser. No. 457,830
Int. Cl.³ G11B 5/30
U.S. Cl. 360—113 4 Claims



1. A magnetic head for detecting information representing magnetic fields on a selected track of a magnetic recording medium, comprising:

an elongated magnetoresistive element having a distant first end and a distant second end opposite thereto, and a central region intermediate to said distant first and second ends;

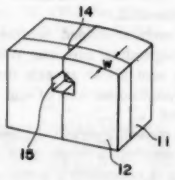
a means for generating a magnetic field within said element; and

a means for detecting a change in resistance of said magnetoresistive element across said central region of said element as said magnetic fields of said recording medium are presented to said central region, said detection means excluding any changes in resistance of the ends of said element.

4,535,376
MAGNETIC HEAD INCORPORATING AN AMORPHOUS MAGNETIC METALLIC FILM HAVING A THICKNESS EQUAL TO A TRACK WIDTH

Noboru Nomura, Kyoto; Eiichi Hirota, Hirakata, and Kiyotaka Wasa, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 17,537, Mar. 5, 1979, abandoned. This application Mar. 15, 1982, Ser. No. 358,608
Claims priority, application Japan, Mar. 3, 1978, 53-24888
Int. Cl.³ G11B 5/12
U.S. Cl. 360—126 24 Claims



1. A magnetic head including at least a core for constituting a magnetic circuit, and a magnetic gap formed in said core, said core comprising:

a support substrate having a first face which is brought into contact with a magnetic recording medium;

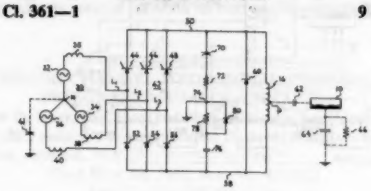
a portion including said first face of said support substrate or said substrate as a whole being made of a non-magnetic high-resistance material; and

an amorphous magnetic metallic film deposited on one or a plurality of faces of said support substrate, which abut on said first face of said support substrate, and deposited at least on said non-magnetic high-resistance material portion, said amorphous magnetic metallic film having a thickness equal to a track width.

4,535,377
SHAFT VOLTAGE SUPPRESSION CIRCUIT

Lawrence J. Lane, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Mar. 28, 1984, Ser. No. 594,214
Int. Cl.³ H02H 9/00
U.S. Cl. 361—1 9 Claims



1. For use with electric motors and generators, of the type including a field winding supported by a shaft which is movable within bearings, which is supplied by way of relative positive and negative buses with electrical power from a source including an electrical power conversion bridge having controlled rectifiers and uncontrolled rectifiers, circuit means for suppressing voltages coupled to said shaft from said field winding, said circuit means comprising:

(a) a first series combination of a first resistor and a first capacitor connected between said positive bus and a common voltage;

(b) a second series combination of a second resistor and a second capacitor connected between said negative bus and said common voltage; and,

(c) means associated with said second series combination to establish a low impedance path including said second capacitor for currents flowing from the negative bus to the common voltage and a path having a high impedance relative to said low impedance path including said second resistor and said second capacitor for currents flowing from said common voltage to said negative bus.

4,535,378
OVERCURRENT DETECTOR FOR AN INVERTER

Tamotu Endo, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 1, 1983, Ser. No. 547,588
Claims priority, application Japan, Nov. 16, 1982, 57-200641; Dec. 17, 1982, 57-221328; Jun. 28, 1983, 58-116392
Int. Cl.³ H02H 7/122
U.S. Cl. 361—18 18 Claims

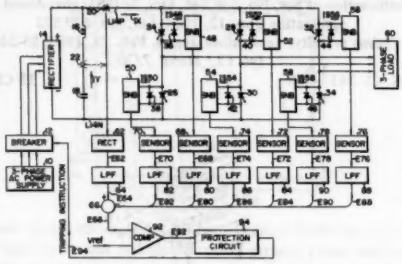
1. An overcurrent detector for an inverter, which includes a filter capacitor and a snubber circuit, comprising:

first means for detecting a current flowing through the DC main circuit of said inverter or a current flowing through said filter capacitor, and for providing a first signal in proportion to the magnitude of said current;

second means for generating a second signal corresponding to the magnitude of a snubber current flowing through said snubber circuit; and

third means for generating a third signal corresponding to

the difference between said first and second signals, said third signal being an output signal of said overcurrent



detector and being utilized for the purpose of protecting the operation of said inverter.

4,535,379

TELEPHONE PROTECTOR MODULE WITH AUXILIARY FUSIBLE ELEMENT

Paul V. De Luca, Plandome Manor, and Helmuth Neuwirth, Garden City, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed Apr. 27, 1984, Ser. No. 604,882

Int. Cl.³ H02H *9/06*

U.S. Cl. 361—124 **3 Claims**

1. In a telephone protector module for protecting individual subscriber pairs, including a housing, a pair of long and short contacts for tip and ring circuits, a pair of heat coil assemblies for protecting against excess current surges, a pair of arcing devices for protecting against excess voltage surges, and a grounding element communicating with said tip and ring circuits, the improvement comprising: said grounding element including a ground pin axially aligned within said housing and having an outer end projecting outwardly therefrom, said ground pin having an inner end; a planar ground plate secured to said inner end and lying in a plane perpendicular to the axis of said pin, said ground plate having laterally extending portions overlying one end of said arcing devices; a solder plate of fusible material maintained in congruent relation to said ground plate, and interposed between said ground plate and arcing devices, said solder plate serving as a heat sink upon the occurrence of an excess current surge during a period prior to the firing of said heat coil assemblies.

4,535,380

IGNITION SYSTEM

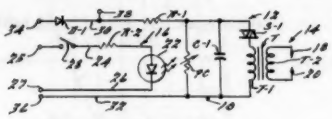
Frederick J. Geary, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 23, 1984, Ser. No. 613,183

Int. Cl.³ F23Q *3/01*; F02P *3/08*

U.S. Cl. 361—256 **21 Claims**

1. In an ignition system, the combination including a high voltage pulse generator circuit, a combustion initiator circuit, a low voltage control circuit, and means interfacing said pulse generator circuit and said combustion initiator circuit, said high voltage pulse generator circuit including a load, a breakover device connected in series with said load, a capacitor connected in parallel with the series combination of said breakover device and said load, a resistor connected to said capaci-



tor, and shunt means connected across said capacitor, said low voltage control circuit including means controlling conduction through said shunt means and additional switch means controlling the energization of said low voltage control circuit.

4,535,381

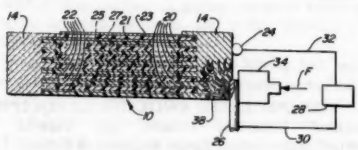
CAPACITIVE DEVICE AND METHOD OF PACKAGING THAT DEVICE

Charles C. Rayburn, Lynchburg, Va., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Nov. 17, 1983, Ser. No. 552,891

Int. Cl.³ H01G *1/13, 4/10*; B65D *65/00*

U.S. Cl. 361—308 **44 Claims**



1. A capacitive device formed in a solid shape having a length defined by a first end and a second end, a width defined by a first edge and a second edge and a height defined by a top and a bottom, said capacitive device comprising a plurality of strata of capacitive structure, a protective means and electrical connection means; said plurality of strata of capacitive structure comprising a plurality of layers of dielectric film, each of said plurality of layers of dielectric material having affixed thereto a metallic film, said plurality of layers being disposed with said metallic film of each layer being separated by dielectric material from said metallic film of an adjacent layer, each of said plurality of layers having metal film extending substantially from said first end to said second end and having said metal film electrically discontinuous at a discontinuity between said first edge and said second edge; said protective means comprising wrapping means covering said top, said first end, said bottom and said second end; said electrical connection means comprising an electrically conductive coating applied to said first edge and said second edge to electrically connect said metallic films of each of said plurality of layers, and said wrapping means being applied sufficiently tightly to the device to mechanically enhance the device, thereby increasing capability of the device to resist delamination.

4,535,382

OIL-IMPREGNATED CAPACITOR

Hidekazu Wada, Itami; Hironori Yoshino, Osaka, and Kohei Shiota, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 14, 1984, Ser. No. 589,546

Claims priority, application Japan, Mar. 14, 1983, 58-41792; Mar. 14, 1983, 58-41787; Apr. 19, 1983, 58-69444; Apr. 19, 1983, 58-69441; Jun. 20, 1983, 58-111239

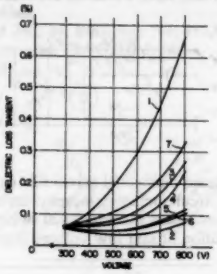
Int. Cl.³ H01G *4/22*

U.S. Cl. 361—319 **29 Claims**

1. An oil-impregnated capacitor comprising,

(a) a capacitor element comprising at least one member

selected from the group consisting of paper and plastic films,



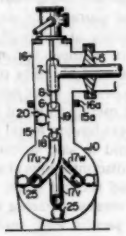
(b) said capacitor element impregnated with a liquid impregnated containing at least one organometallic compound having both a hydrolyzable group and an organic functional group.

4,535,383

GAS-INSULATED SWITCHGEAR EQUIPMENT

Yukinori Yamaoka, Hitachi, and Takeshi Takahashi, Kitaibaraki, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 2, 1984, Ser. No. 606,221
Claims priority, application Japan, May 2, 1983, 58-76143
Int. Cl.³ H02B *1/20*; H01H *33/54*
U.S. Cl. 361—341 **2 Claims**



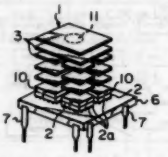
1. In a gas-insulated switchgear equipment which includes a main bus conduit containing a main bus conductor and disposed substantially horizontally, and a container connected to said main bus conduit at a top portion thereof for accommodating a disconnecting switch unit, wherein said disconnecting switch unit is composed of a pair of contact members one of which is to be electrically connected to said bus conductor, said gas-insulated switchgear equipment comprising: spacers disposed substantially vertically at predetermined positions in said main bus conduit for defining a gas-filled compartment for said disconnecting switch unit, post-like insulation support means fixedly mounted on said container of said disconnecting switch unit for securely supporting a stationary conductor mounted on the contact member to be electrically connected said bus bar, and a tulip-like current collector for connecting one end of a branch conductor having the other end connected to said bus conductor and said stationary conductor to each other.

4,535,384

HEAT SINK FOR A SEMICONDUCTOR DEVICE

Tetsushi Wakabayashi, Kawasaki; Norio Honda, Aizuwakamatsu, and Osamu Sakuma, Yokohama, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 538,846, Oct. 5, 1983, abandoned. This application Jun. 12, 1984, Ser. No. 620,522
Claims priority, application Japan, Feb. 29, 1980, 55-24689
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—386 **13 Claims**



1. A semiconductor device, comprising:

(a) a mother board;

(b) a plurality of IC packages mounted in a matrix arrangement on said mother board, each with a first main surface thereof adjacent to said mother board and a second main surface thereof remote from said mother board, each of said plurality of IC packages housing a semiconductor element therein and having electrical connecting means projecting from said first main surface, and being coupled to said mother board by using only said electrical connecting means; and

(c) heat sink means including a base board portion being joined only to said second main surface of said plurality of IC packages, a heat conducting shaft portion arranged approximately perpendicular to said base board portion and a plurality of heat dissipating fins disposed on and extending outwardly from and approximately perpendicular to said heat conducting shaft portion in spaced, approximately parallel relationship to each other,

wherein said heat sink means includes a common heat sink having at least one slit extending parallel to and through said heat conducting shaft from said base board portion to approximately midway of the height of said heat conducting shaft to define a number of sections of said base board portion respectively corresponding to said plurality of IC packages, and

wherein said common heat sink is joined to said plurality of IC packages at said sections of said base board portion.

4,535,385

CIRCUIT MODULE WITH ENHANCED HEAT TRANSFER AND DISTRIBUTION

Melvin C. August, and John T. Williams, both of Chippewa Falls, Wis., assignors to Cray Research, Inc., Minneapolis, Minn.

Filed Apr. 22, 1983, Ser. No. 487,516
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—388 **7 Claims**

7. A circuit module with enhanced heat transfer and distribution characteristics, comprising:

a pair of circuit boards each having top and bottom sides, and conductive signal plane and ground plane layers;

a plurality of electronic devices mounted on the top side of each circuit board;

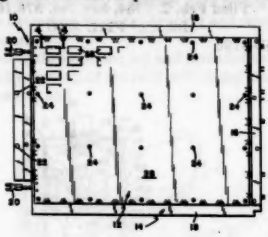
a cooling plate extending between said circuit boards;

means mechanically interconnecting said circuit boards and said cooling plate in predetermined minimal spaced-apart relationship;

a first thermally-conductive pad engaged between each electronic device and the top side of each circuit board;

a second thermally-conductive pad disposed on the bottom side of each circuit board opposite each first pad; and

at least one thermally-conductive plated-through hole interconnecting each associated pair of first and second pads,



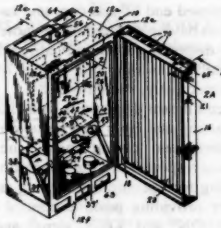
said plated-through holes being isolated from the signal plane layers but connected to the ground plane layer of said circuit boards so as to distribute heat from said electronic devices across said boards while conducting heat through said boards for transfer to said cooling plate.

4,535,386

NATURAL CONVECTION COOLING SYSTEM FOR ELECTRONIC COMPONENTS

Sydney W. Frey, Jr., Brookfield, and Mark I. Herson, South Milwaukee, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed May 23, 1983, Ser. No. 497,099
Int. Cl.³ H05K 7/20
U.S. Cl. 361—389 **8 Claims**



1. A convection cooling system which houses electronic components, said system comprising:

a housing which defines a cavity and which includes a door that may be opened to gain access to the cavity;

a chassis base secured within said housing near its bottom, the chassis base supporting said electronic components;

an inner chimney secured within said housing and mounted to the top of said chassis base so that the chassis base and the inner chimney divide the cavity into a forward compartment and a rearward compartment, said inner chimney ducting the air heated by the electronic components upward through a chimney void to the top of the forward compartment of said housing, thereby creating an upward draft in the chimney void which forces a downward air circulation within the forward compartment of said housing; and

a heat exchanger providing a cool surface exposed to the interior of said forward compartment so that the heated air at the top of said forward compartment flows downwardly along said heat exchanger cooled surface to the bottom of said housing.

4,535,387

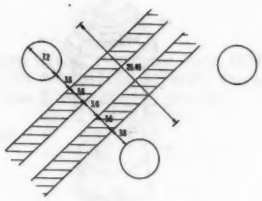
Patent Not Issued For This Number

4,535,388

HIGH DENSITY WIRED MODULE

Charles J. Kraus, Poughkeepsie; Herbert I. Stoller, Wappingers Falls, and Leon L. Wu, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,359
Int. Cl.³ H05K 1/08
U.S. Cl. 361—414 **5 Claims**



1. A high density module with semiconductor device chips comprising:

a first plurality of wiring planes, each having a first number of vias with a first number of wiring channels running orthogonally between said vias, and a first number of conductors in said channels,

a second plurality of wiring planes, each having half said first number of vias corresponding to alternate ones of said first number of vias and with a greater than said first number of channels with second conductors running diagonally between said vias of said second plurality of wiring planes,

said first planes being assembled into a first group and

said second planes being assembled into a second group,

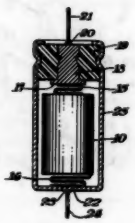
said first group being placed between said chips and said second group.

4,535,389

ELECTROLYTIC CAPACITOR

Gary J. Buczkowski, and E. James Fresia, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Sep. 21, 1984, Ser. No. 652,998
Int. Cl.³ H01G 9/02
U.S. Cl. 361—433 **5 Claims**



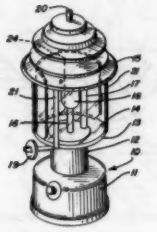
1. An electrolytic capacitor comprising two contiguously wound foil electrodes with interleaved spacer material, at least one of said electrodes bearing a barrier layer dielectric oxide, said electrodes being in contact with an electrolyte consisting of 3 to 10 wt percent ammonium benzoate, 4 to 16 wt percent water, 75 to 93 wt percent ethylene glycol, 0 to 4 wt percent of a nitro compound as a depolarizer and 0 to 0.5 wt percent of a phosphate, said electrolyte having a resistivity of 385 to 620 ohm-cm and providing a capacitor capable of operation above 100 V and 95° C. and higher.

4,535,390

FOLDING REFLECTOR FOR A LANTERN

Richard D. Curtis, and James R. Conley, both of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Jun. 22, 1984, Ser. No. 623,834
Int. Cl.³ F21L *19/00*
U.S. Cl. 362—179 **14 Claims**



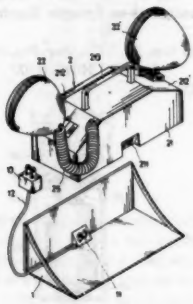
1. A folding reflector for a lantern having a fuel fount, a light source above the fuel fount, and a globe surrounding the light source, the reflector comprising a pair of reflecting panels and means for pivotally securing the panels for pivoting movement about an axis which extends perpendicularly to the panels so that the panels may be pivoted between a folded position in which the panels are superposed and an extended position in which the panels extend in opposite directions from the securing means and in which the panels can extend around a portion of the globe.

4,535,391

PORTABLE EMERGENCY LIGHT

Meng-Chang Hsiao, No. 61-1, Fu-Te St., Sung-Shan Dist., Taipei, R.O.C., Taiwan

Filed Jul. 20, 1984, Ser. No. 632,886
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—183 **4 Claims**



1. A portable emergency light which can be used as a stationary emergency light while it is fixed at a place and as a portable light after removing it from its fixed place comprising:

a light housing

at least two lamps wherein at least one lamp has an extension cord which can be detached from the light housing;

lamp lowering means for minimizing the space requirements of the lamps; and

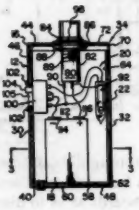
a flickering controller for said lamps and switches which control each said lamp for lighting, extinguishing or flickering respectively a said lamp.

4,535,392

PERSONAL ALERT SIGNAL

William J. I. Montgomery, 9250 Pinetree Rd., Sidney, B.C., Canada (V8L 3W2)

Filed Feb. 2, 1984, Ser. No. 576,160
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—186 **11 Claims**



1. A personal safety device for producing a controllable flashing light signal, comprising:

a casing constructed of light-weight plastic and arranged to be carried in the hand of a user, including an elongated main body portion having an open top end and a closed bottom end and a cap having a closed top end and an open bottom end arranged to removably telescopingly receive the open top end of said main body portion, said main body, portion and said cap together defining a chamber for removably retaining electrical battery means therein and a hand grippable outer surface;

a lamp assembly secured to and projectng longitudinally from said closed end of said cap, said assembly including a tubular lens having a closed end remote from said casing and a lamp disposed within said lens, said lens having end and side walls permitting light to pass longitudinally and radially, respectively, therethrough;

electrical circuit means disposed in said chamber for electrically connecting said lamp with battery means disposed in said chamber, said circuit means including mercury switch means responsive to the orientation and/or motion of said casing for opening and closing said circuit means and thereby providing positive control of said lamp to produce an "ON" and "OFF" signal; and

second switch means for selectively (a) electrically connecting said mercury switch means in series between said lamp assembly and said battery, (b) electrically connecting said lamp assembly directly to said battery and bypassing said mercury switch means for providing control of a continuous light signal, and (c) electrically disconnecting said lamp assembly and battery.

4,535,393

FLUORESCENT LAMP HOUSING

John E. Aspenwall, Lehi, Utah, assignor to Jahabow Industries, Inc., Owensville, Mo.

Filed Nov. 10, 1983, Ser. No. 550,228
Int. Cl.³ F21S *3/00*
U.S. Cl. 362—217 **1 Claim**

1. A housing for a fluorescent tube comprising

a casing having a curved back, curved apart, diverging legs extending from the curved back;

converging edges at the ends of the legs remote from the curved back;

means forming an electrical chamber and a lamp chamber separated from said electrical chamber in the casing by a divider strip inserted into opposing grooves in the legs;

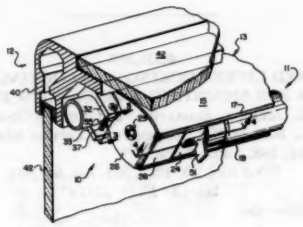
socket means in the lamp chamber to receive the contact pins of a fluorescent tube; and

mounting means for mounting the casing to a support structure, said mounting means including tubular means ex-

tending axially from opposite ends of the electrical chamber; and

clamp means adapted to be fixed to said support structure, said clamp means having a bracket with a back and spaced apart legs extending from the bracket and straddling each tubular means;

a bolt extending through one leg and threaded into the other leg whereby turning of the bolt will clamp the legs to the tubular means; and



means to attach the bracket to a display case or the like, said means comprising an opening through the back for inserting of a screw therethrough to be threaded into a display case, and

a hole through one leg for insertion of a screw therethrough to be threaded into a display case and a larger aligned access hole through the other leg to provide for screwdriver insertion.

4,535,394

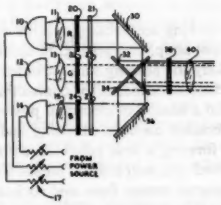
VARIABLE COLOR FLOODLIGHT

Michael A. Dugre, 1218 Hawkes St., Orlando, Fla. 32809

Filed Dec. 8, 1983, Ser. No. 559,298

Int. Cl.³ H05B *41/34*

U.S. Cl. 362—231 **12 Claims**



1. A variable color lighting system comprising:

a variable intensity source of red light;

a variable intensity source of green light;

a variable intensity source of blue light;

a first mirror disposed adjacent said red light source for reflecting a beam of red light from said red light source;

a second mirror disposed adjacent said blue light source for reflecting a beam of blue light from said blue light source;

a first dichroic mirror disposed to reflect said red light beam from said first mirror to form a red component of an output beam, to pass a beam of green light from said green light source therethrough to form a green component of said output beam, and to pass said blue light beam therethrough;

a second dichroic mirror disposed to reflect said blue light beam from said second mirror to form a blue component of said output beam, and to pass said beam of green light from said green light source therethrough, and to pass said red light beam therethrough, and in which said second dichroic mirror and said first dichroic mirror are crossed;

said first dichroic mirror disposed at right angles to said second dichroic mirror to cause said red output beam component, said blue output beam component, and said green light beam to be superimposed forming an additive output beam;

control means associated with said red, green, and blue light sources for independently varying the intensity of each of said sources, thereby varying the color of said output beam.

4,535,395

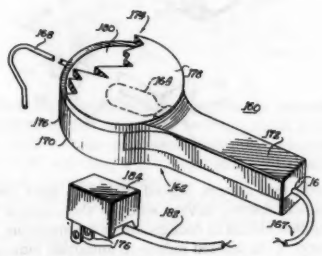
LAMP

Lorrain W. Prester, Box 38, Dorchester, Nebr. 68343

Division of Ser. No. 859,304, Dec. 12, 1977,. This application Aug. 8, 1983, Ser. No. 521,026

Int. Cl.³ F21V *29/00*

U.S. Cl. 362—267 **1 Claim**



1. A lamp comprising;

an incandescent light bulb;

a clear plastic housing;

said light bulb being within said clear plastic housing;

said clear plastic housing having two relatively wide parallel walls and a narrower connecting edge;

conductors extending from said incandescent light bulb and being electrically connected to opposite ends of the filament thereof;

said housing including internal walls forming an opening communicating with said conductors;

means for electrically connecting said conductors to an external source of electrical power;

a magnet;

said magnet being embedded in said plastic housing, whereby said lamp may be magnetically mounted above a work place;

said handle being integrally formed with said plastic housing and said conductors extending through said handle;

said housing including a reflector and a plastic lens;

said reflector and lens being positioned on opposite sides of said incandescent light bulb;

said plastic lens being shaped as a convex lens; and

said lens being integrally formed with at least a portion of said handle.

4,535,396

SUNLIGHT READABLE ILLUMINATED INDICIA DISPLAY DEVICES

Don W. Guthrie, Bedford, Tex., assignor to Aerospace Optics, Inc., Fort Worth, Tex.

Continuation of Ser. No. 384,033, Jun. 1, 1982, abandoned. This application Aug. 20, 1984, Ser. No. 642,152

Int. Cl.³ F21V *9/00*

U.S. Cl. 362—293 **40 Claims**

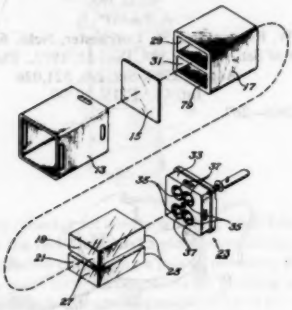
1. An indicia display device for presenting an indicia display that is sunlight readable, comprising:

a. a lens system having one or more body portions each of which provides a transparent internal light reflecting

medium interposed between a light receiving surface and a light transmitting surface;

b. a legend plate disposed to receive light from said light transmitting surface, said legend plate being a laminate made up of mutually bonded elements including one or more filters and wherein the front bonded element is an absorption filter having a diffuse front surface; and

c. a light source disposed to supply light to said light receiving surface;



d. said lens system, legend plate and light resulting in an indicia display device wherein the contrast ratio of the lighted indicia to background is 0.6 minimum, the contrast ratio of the lighted indicia to unlighted indicia is 0.6 minimum, and the contrast ratio of unlighted indicia to background is 0.05 (absolute value) maximum, with said contrast ratios being measured in an ambient light level of not less than 10,000 foot candles including light resulting from direct sunlight impinging on said indicia display device at a glare producing angle.

4,535,397

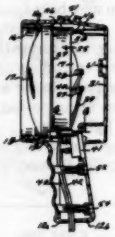
PORTABLE SPOTLIGHT

Richard L. May, Manhattan Beach, Calif., assignor to Mr. Gasket Company, Cleveland, Ohio

Filed Dec. 5, 1983, Ser. No. 558,318

Int. Cl.³ B60Q *1/00*

U.S. Cl. 362—369 **3 Claims**



1. A portable spotlight assembly conformed for electrical excitation from the battery circuit of a motor vehicle comprising:

a housing including a hollow front housing section and a hollow rear housing section conformed to mate to each other, said front and rear housing sections effecting latching engagement proximate one end thereof and fastening means proximate the other end;

a sealed beam lamp received within the common interior of said front and rear housing sections cooperate to define a cylindrical enclosure receiving said lamp and a handle extending radially therefrom, said front and rear housing sections effecting latching engagement on the cylindrical enclosure thereof and fastening means in the handle;

a retaining ring mounted in the rear housing section and aligned to translate along a plurality of guide posts against the rear surface of said lamp including spring means for urging the translation thereof; and

a retaining bead in said front housing section for opposing said lamp and said ring.

4,535,398

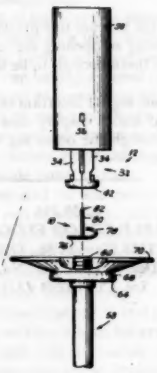
COMBINED LINER LOCKING AND LOCKING WASHER SYSTEM FOR MOUNTING AN INCANDESCENT LAMP

George E. Johnson, Bronxville, and Stanley Brenner, Massapequa, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Aug. 20, 1984, Ser. No. 641,902

Int. Cl.³ F21V *21/14*

U.S. Cl. 362—404 **8 Claims**



1. A liner locking and locking washer system for mounting an incandescent lamp, comprising, in combination:

a socket body for holding said incandescent lamp,

electrical conductor means for connecting said incandescent lamp with a source of electrical power,

elongated bracket means for holding said socket body at one end and forming a hole provided with internal threads at the opposed end, said bracket means also being for passing said conductor means from said socket body through said hole.

an elongated liner having a cylindrical wall forming a hollow cylinder adapted to be slidingly positioned around said socket body and said elongated bracket means, said outer wall forming a slot proximate to said internal threads,

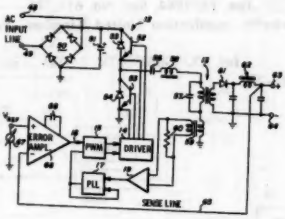
fixture means for mounting said bracket means to a support structure at one end and having external threads at the other end that are matingly connected to said internal threads of said elongated bracket means, said fixture means also being for passing said conductor means from said bracket means to said source of electrical power, said fixture means including stop means positioned proximate to said external threads for preventing said liner from sliding onto said fixture member, and

unitary washer and clip means for providing a locking washer between said stop means of said fixture means and for interacting waith said slot of said liner for removably locking said unitary means with said liner and so preventing said liner from sliding away from said fixture means while in a locked mode.

4,535,399
REGULATED SWITCHED POWER CIRCUIT WITH RESONANT LOAD

Tamas S. Szepesi, Eichenau, Fed. Rep. of Germany, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 3, 1983, Ser. No. 500,750
Int. Cl.[3] H02M 1/00
U.S. Cl. 363—41 6 Claims



1. A circuit for controlling a substantial power output with a d-c control potential, said circuit comprising:

a resonant load in which a tuned circuit provides a quasi sine shaped current wave form in a power dissipating element;

a source of d-c input power;

switching means coupled between said source of input power and said resonant load whereby said load is supplied with current pulses at a rate that is slightly in excess of the resonant frequency of said resonant load;

means for modulating the width of said pulses to vary the power transferred into said resonant load;

a phase locked loop having an internal oscillator coupled to a divide by two buffer whereby said oscillator is operated at two times the desired frequency and produces asymmetrical output signals that includes a sawtooth output and a pulse output, a memory type phase comparator, an integrator type loop filter, an output, and a pair of inputs one of which is coupled to said output whereby the frequency of said oscillator is varied until the output phase matches the phase of the signal fed to the other of said pair of inputs;

means for sensing the current flowing in said resonant load;

means for shaping the signal provided by said means for sensing to develop a pulse signal in phase with said quasi sine wave load current;

means for applying the shaped signal to said other of said pair of inputs of said phase locked loop;

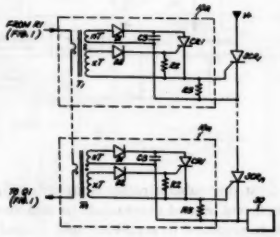
a high gain comparator having one input coupled to receive said sawtooth oscillator output and the other input coupled to receive a d-c control voltage with the comparator output being a pulse of variable width as determined by said d-c control voltage; and

means for feeding said comparator output to one input each of first and second three input AND gates, means for feeding the output of said divide by two buffer to the second input of said first AND gate and its complement to said second input of said second AND gate, and means for feeding the pulse output of said oscillator to each of the third imputs of said first and second three input AND gates whereby said AND gates develop alternating output pulses having widths determined by said d-c control voltage.

4,535,400
MEANS AND METHOD FOR SIMULTANEOUSLY TRIGGERING SERIES SCR'S

Abdallah M. Itani, Saratoga, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,307
Int. Cl.[3] H02M 7/12; H03K 17/56
U.S. Cl. 363—68 5 Claims



1. A method for simultaneously triggering a plurality of serially connected silicon controlled rectifiers (SCR's) having a relatively high voltage impressed across the plurality of SCR's, each SCR including a gate input adapted to receive a triggering signal thereto, comprising:

(a) storing in each of a plurality of first storage means at least a portion of energy available from a relatively low voltage source of energy;

(b) storing at least said portion of the energy available from said source of energy in a second storage means;

(c) transferring energy stored in said second storage means to each of said plurality of first storage means by discharging the energy stored in said second storage means through each primary winding, respectively, of a plurality of pulse transformers, respectively, each pulse transformer comprising a secondary winding connected to a respective one of said plurality of first storage means so as to provide a pulse of energy thereto of duration substantially half that of the discharge of energy stored in said second storage means; and

(d) releasing simultaneously the energy stored in each of said plurality of first storage means, respectively, to each respective gate input of a corresponding one of each of said plurality of SCR's, respectively, whereby a triggering signal is generated for each of said plurality of SCR's.

4,535,401
APPARATUS AND METHOD FOR PROVIDING POWER FROM MASTER CONTROLLER TO SUBCONTROLLERS AND DATA COMMUNICATION THEREBETWEEN

Thomas C. Penn, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 30, 1982, Ser. No. 394,033
Int. Cl.[3] G06F 15/46
U.S. Cl. 364—132 12 Claims

1. A communication system comprising:

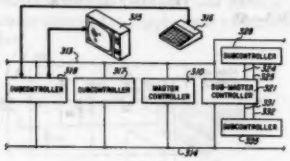
master controller means for providing three different voltage levels including pulses of first and second voltage levels, the pulses of said first voltage level being power pulses;

subcontroller means including at least one subcontroller adapted to store energy and to selectively transmit information upon being powered by the energy stored thereby;

first and second conductors extending between said master controller means and said subcontroller means and coupling said subcontroller means to said master controller means, said first and second conductors being normally disposed at the third voltage level;

said master controller means providing pulses of said first voltage level to supply power along said first and second

conductors to be received by said subcontroller means as energy stored therein and providing said second voltage level pulses to address said at least one subcontroller; and

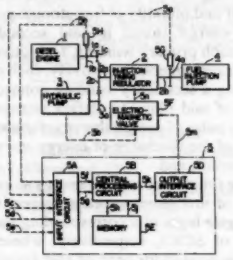


said at least one subcontroller transmitting information on said first and second conductors to said master controller means in response to receiving said second voltage level pulses therefrom.

4,535,402
DIGITAL CONTROL METHOD

Yuzo Koyanagi, Warabi, Japan, assignor to Sanwa Seiki Mfg. Co., Ltd., Saitama, Japan

Filed Dec. 18, 1981, Ser. No. 332,010
Claims priority, application Japan, Dec. 27, 1980, 55-189100; Dec. 27, 1980, 55-189104; Dec. 27, 1980, 55-189105
Int. Cl.³ G05B *15/02*
U.S. Cl. 364—152 **5 Claims**



1. A method of digital control by use of a train of command signal pulses, comprising the steps of:

(a) intermittently detecting the successive values of a parameter;

(b) determining the deviation of each detected value from a target value of the parameter;

(c) comparing the absolute value of each deviation with the absolute value of a predetermined minimum reference deviation;

(d) if the absolute value of a determined deviation is less than the absolute value of said minimum reference deviation, setting the next command signal pulse to zero;

(e) if the absolute value of a determined deviation is greater than the absolute value of said minimum reference deviation, determining the sign of the determined deviation and settiing the duration of the next command signal pulse to a fundamental duration proportional to the determined deviation;

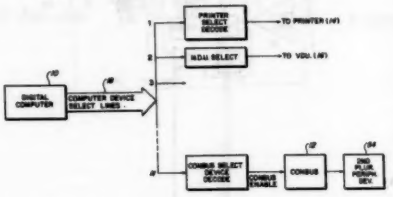
(f) if the absolute values of a determined deviation and its next preceding determined deviation are both greater than the absolute value of said minimum reference deviation, determining the signs of the two successive deviations and, if both signs are the same, adding a given duration to the fundamental duration of the next command signal pulse or, if the signs are different, subtracting a predetermined duration from the fundamental duration; and

(g) outputting the next command signal pulse with a time lapse after each detection of the value of the parameter.

4,535,403
SIGNAL GENERATOR FOR INTERFACING DIGITAL COMPUTER TO A PLURALITY OF PERIPHERAL DEVICES

Geoffrey N. Holland, Chagrin Falls, Ohio, assignor to Picker International Limited, Middlesex, England

Continuation of Ser. No. 337,186, Jan. 5, 1982,. This application Jun. 11, 1984, Ser. No. 618,776
Claims priority, application United Kingdom, Feb. 2, 1981, 8101174
Int. Cl.³ G06F *3/04, 13/00*
U.S. Cl. 364—200 **2 Claims**



1. An apparatus allowing a digital computer adapted to directly select one of a predetermined number of peripheral devices to interface with more than the predetermined number of peripheral devices, said apparatus comprising:

(a) a digital computer;

(b) a first plurality of peripheral devices wherein one of said first plurality of peripheral devices is an interface apparatus, said first plurality of peripheral devices being of said predetermined number;

(c) a device select bus directly coupled between said digital computer and said first plurality of peripheral devices for directly selecting one of said first plurality of peripheral devices;

(d) a data output bus directly coupled between said digital computer and said first plurality of peripheral devices for allowing said digital computer to provide data output signals directly to a selected one of said first plurality of peripheral devices;

(e) an output control bus directly coupled between said digital computer and said first plurality of peripheral devices for allowing said computer to provide output control signals directly to a selected one of said first plurality of peripheral devices;

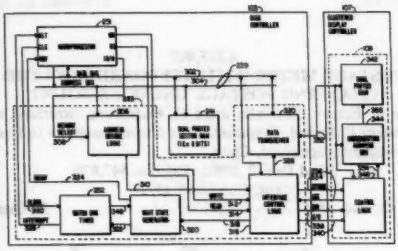
(f) a second plurality of peripheral devices; and

(g) said interface apparatus being coupled to said second plurality of peripheral devices and being coupled to said data output bus and selectively responsive to the data output signals to supplement said device select bus for selecting one of said second plurality of peripheral devices for allowing said digital computer to be interfaced with said second plurality of peripheral devices, said interface apparatus being selected by said digital computer via said device select bus, said interface apparatus including a decoder coupled to said output control bus for being enabled by the output control signals provided by said digital computer, said decoder being coupled to said data output bus and being responsive to the data output signals provided by said digital computer for deriving from the data output signals an address of one of said second plurality of peripheral devices to be interfaced with said digital computer, said decoder providing output signals for selecting the addressed one of said second plurality of peripheral devices.

4,535,404
METHOD AND APPARATUS FOR ADDRESSING A PERIPHERAL INTERFACE BY MAPPING INTO MEMORY ADDRESS SPACE

William H. Shenk, Acton, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 29, 1982, Ser. No. 373,062
Int. Cl.[3] G06F *3/04*
U.S. Cl. 364—200 13 Claims



1. An apparatus for transferring information across an interface between a first subsystem and a second subsystem of a system, wherein said first subsystem includes a programmable processor and a memory, said processor capable of executing memory reference instructions which reference by a memory address data stored in said memory, said apparatus comprising:

A. address decoding means coupled to said processor, said address decoding means for detecting said memory address of said memory reference instructions which address a predetermined memory location in said memory;

B. interface control means coupled to said address decoding means and said processor, said interface control means responsive to said address decoding means when said address decoding means detects said memory reference instruction being executed which addresses said predetermined memory location for generating a strobe signal to said second subsystem and for receiving an acknowledge signal from said second subsystem;

C. a wait means coupled to said interface control means and said processor, said wait means responsive to said interface control means for generating a wait signal to place said processor in a wait state at the time said interface control means generates said strobe signal and for removing said processor from said wait state upon receipt of said acknowledge signal by said interface control means from said second subsystem; and

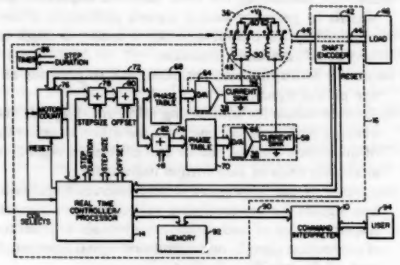
D. transceiver means coupled to said interface control means, said processor and said second subsystem, said transceiver means for receiving data from said processor during the execution of said write memory reference instruction and transmitting the data to said second subsystem and for receiving data from said second subsystem and transmitting the data to said processor during the execution of said read memory reference instruction

whereby said first subsystem can transfer information to or from said second subsystem by said processor executing memory reference instructions addressing said predetermied memory locations thereby effectively mapping said interface into the address space of said memory.

4,535,405
CONTROL AND FORCE-SENSING METHOD AND APPARATUS FOR MOTORS

John W. Hill, Palo Alto, and Anthony J. Sword, San Francisco, both of Calif., assignors to Microbot, Inc., Mountain View, Calif.

Filed Sep. 29, 1982, Ser. No. 426,631
Int. Cl.[3] G05B *19/40*
U.S. Cl. 364—400 9 Claims



1. A method of measuring a torque being applied by the shaft of a brushless motor to a load which is driven by the shaft of the brushless motor, comprising the steps of

calibrating the brushless motor for angular displacement versus magnitude of applied load to form a calibration table;

commanding the brushless motor to a designated angular position;

measuring the actual angular position of the shaft of the brushless motor;

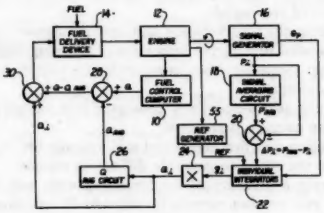
determining the angular displacement between the commanded and the actual positions; and

converting the angular difference into a torque quantity by obtaining, from the calibration table, the torque quantity which corresponds to the angular difference.

4,535,406
FUEL DISTRIBUTION CONTROL FOR AN INTERNAL COMBUSTION ENGINE

Edwin A. Johnson, Clarkston, Mich., assignor to Allied Corporation, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,817
Int. Cl.[3] F02B *3/12*; F02D *5/02*; F02M *51/00*
U.S. Cl. 364—431.08 22 Claims



1. A fuel distribution control for a multiple cylinder internal combustion engine having a rotary output member, a fuel control computer responsive to the operational parameters of the engine for generating base fuel quantity signals, fuel delivery means responsive to fuel delivery signals for delivering fuel to each engine cylinder, and an operational cycle in which each cylinder produces a torque impulse rotating the engine's output member; the fuel distribution control characterized by:

means for detecting predetermined rotational positions of

the engine's output member to generate sequential position signals indicative of equal rotational intervals of the output member during an operational cycle of the engine, each of said equal rotational intervals being associated with the torque impulses produced by one of the engine cylinders;

means for detecting when of of the engine cylinders has a predeterminable state to generate a reference signal once during each engine operational cycle.

means for measuring the time between sequential position signals to generate period signals indicative of the time required by the output member to rotate through each of said equal rotational intervals,

means for averaging said period signals to generate an average period signal,

difference means for subtracting said period signals and said average period signal, one from the other, to generate a set of difference signals, one of said difference signals associated with each of said torque impulses;

integrator means responsive to said reference and said position signals for accumulating said difference signals with respect to each of said rotational intervals to generate a set of correction signals, one correction signal associated with each of the engine cylinders;

means for averaging said set of correction signals to generate an average correction signal; and

means for summing said correction signals one at a time and in a predetermined sequence, with said average correction signal and said base fuel quantity signal to generate fuel delivery signals activating said fuel delivery means to deliver a quantity of fuel to each engine cylinder tending to equalize the torque impulse produced by all of the engine's cylinders and equalize the contribution of each engine cylinder to the total torque output of the engine.

20. A method for distributing the fuel being delivered to a multiple cylinder internal combustion engine having an output member rotatable through a predetermined angle during each operational cycle of the engine, fuel control computer means for generating base fuel quantity signals in response to the operational parameters of the engine, and fuel delivery means for delivering fuel to the cylinders in response to fuel delivery signals, and wherein the burning of the fuel in the individual cylinders produces torque impulses rotating the output member, said method comprising the steps of:

detecting predetermined rotational positions of the engine's output member to generate position signals dividing the predetermined angle of the engine's operational cycle into equal angular increments equal in number to the number of cylinders in the multiple cylinder engine;

detecting a predetermined state of one particular cylinder to generate a reference signal once during each operational cycle of the engine;

measuring the time between said position signals to generate sequential first signals indicative of the magnitude of individual torque impulses imparted to the output member by the cylinders;

averaging said sequentially generated first signals to generate an average first signal;

subtracting said first signal and said average first signal, one from the other, to generate difference signals;

activating a plurality of accumulators with said reference and said position signals to individually accumulate said difference signals with respect to each cylinder to generate fuel quantity correction signals for each cylinder;

averaging the fuel quantity correction signals for all of the cylinders to generate an average fuel quantity correction signal;

summing said base fuel quantity signal with said average fuel quantity correction signal and the fuel quantity correction associated with cylinder to which fuel is to be delivered to generate a corrected fuel quantity signal; and

activating fuel delivery means with said corrected fuel quantity signals to deliver a quantity of fuel to each engine cylinder tending to equalize the contribution of each cylinder to the total output torque of the engine.

4,535,407

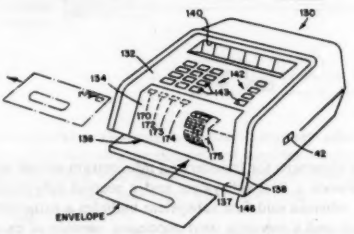
POSTAGE METER WITH KEYBOARD KEYS FOR CHANGING POSTAGE UNUSED AMOUNT

Alton B. Eckert, Norwalk; John H. Soderberg, Stratford, and Edward C. Duwel, Trumbull, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 8, 1982, Ser. No. 447,870

Int. Cl.[3] **G06F** *15/20*

U.S. Cl. 364—464 **21 Claims**



1. In a postage meter having means for printing postage, means for displaying numerical values, means for entering data, computer means electrically connected to each of the aforesaid means and programmed for processing data for controlling the operation thereof, wherein said computer means includes means for storing a first amount corresponding to all postage then available for printing, an improvement for changing the said first amount to a new first amount, said improvement comprising:

(a) said data entering means including a keyboard, said keyboard including a plurality of depressable numeric keys and at least two depressable special purpose keys;

(b) said computer means programmed for causing said displaying means to display a first numerical value in response to the depression of selected numeric keys, said first numerical value corresponding to a second amount desired to be added to said first amount;

(c) said computer means programmed for causing said display means to display a second numerical value in reponse to the depression of selected numeric keys, said second numerical value corresponding to a predetermined combination;

(d) said computer means programmed for entering said second amount in response to the depression of one of said special purpose keys and for entering said combination in response to the depression of another of said special purpose keys; and

(e) said computer means programmed for automatically processing said second amount and said combination in response to entry of the later one of said second amount and said combination for adding said second amount to said first amount, whereby said first amount is changed to said new first amount.

4,535,408

NUMERICAL CONTROL MACHINING METHOD AND APPARATUS

Hajimu Kishi, Hino; Kunio Tanaka, Hachioji, and Masaki Seki, Tokyo, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

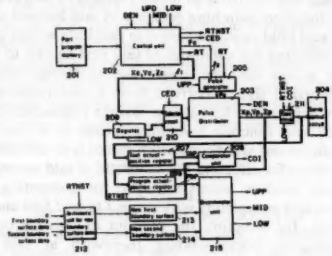
PCT No. PCT/JP82/00093, § 371 Date Nov. 26, 1982, § 102(e) Date Nov. 26, 1982, PCT Pub. No. WO82/03353, PCT Pub. Date Oct. 14, 1982

PCT Filed Apr. 1, 1982, Ser. No. 445,371

Claims priority, application Japan, Apr. 1, 1981, 56-049195

Int. Cl.³ G06F *15/46;* G05B *19/18*

U.S. Cl. 364—475 **10 Claims**



1. A numerical control machining method in which a workpiece is machined on the basis of curved surface data defining a curved surface, comprising the steps of:

(a) entering an appointed boundary surface as a first machining limit;

(b) determining a second machining limit from the first machining limit;

(c) discriminating whether a tool lies between the first and second machining limits;

(d) machining on the basis of said curved surface data when said tool lies between the first and second machining limits and machining on the basis of both said curved surface data not outside the first and second machining limits and the machining limit exceeded when said tool would be outside the machining limit exceeded;

(e) setting the first machining limit to the second machining limit and rapid feeding the tool to the intersection of the first machining limit and said curved surface data when it reaches the first machining limit while machining on the basis of said curved surface data; and

(f) returning to step (b).

4,535,409

MICROPROCESSOR BASED RECLOSER CONTROL

James A. Jindrick, Racine; Thomas G. Dolnik, Kenosha; Naresh K. Nohria, Milwaukee; Clyde Gilker, So. Milwaukee; James R. Hurley, Brookfield; Michael P. Dunk, Racine; Norbert J. Reis, and Thomas J. Bray, both of Milwaukee, all of Wis., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Sep. 18, 1981, Ser. No. 303,626

Int. Cl.³ G06G *7/62, 7/63;* G01R *19/00, 21/00*

U.S. Cl. 364—481 **9 Claims**

1. A recloser control comprising:

an input circuit for sensing current in each of the three phases of a power line and ground, and providing an analog signal for each;

a multiplexing circuit for selectively transmitting each of the analog input signals;

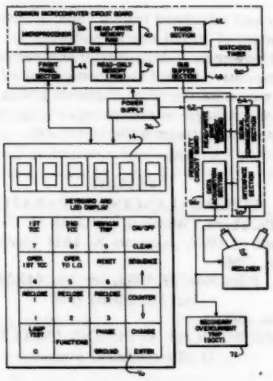
a normalizing scaling amplifier for selectively normalizing each of the analog input signals selected by the multiplexer in accordance with a preselected normalizing reference selected from a plurality of normalizing references;

a sample and hold circuit for sampling the analog output of the normalizing scaling amplifier and maintaining it for a desired preselected holding period;

an analog to digital converter for converting the analog output of the sample and hold circuit to a digital form;

memory means for storing command information in digitized form including normalizing references, time current characteristics, instantaneous trip values, number of operations associated with a given time current characteristic, time intervals for selected measurements and operations, and status information such as digitized current magnitudes;

processing means for generating an equivalent to a mean square value for each digitized normalized input signal, comparing the mean square equivalent values of the inputs with a preselected one of a number of time current characteristics stored in memory means in accordance with other command information stored in the memory means, and receiving and issuing operating signals including an operation command which causes the recloser to change its state between close and trip conditions;



a power supply for selectively supplying power to the other portions of the control from the power line being protected, said power supply including a storage means to supply power when the power lines being protected are interrupted;

a secondary overcurrent trip circuitry which continually receives input signals proportionate to currents in each of the three phases of a power line and ground for generating a trip signal when any sensed current exceeds a fixed secondary time current characteristic after a period of time in accordance with that time current characteristic, if not disabled by said processor means;

output means for activating trip means in the recloser in accordance with operation commands from the processor means or a trip signal from the secondary overcurrent trip circuitry, or close means in the recloser in accordance with operational commands from the processor means; and

input means for entering command information.

4,535,410

POWER SUPPLY FAILURE EARLY WARNING DETECTOR

Bradley E. O'Mara, Sunnyvale, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Jul. 6, 1982, Ser. No. 395,670

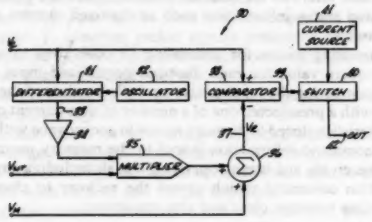
Int. Cl.³ G06F *15/20;* G06G *7/62;* G08B *21/00*

U.S. Cl. 364—483 **16 Claims**

1. Apparatus for detecting imminent failure of a power supply of the type including energy storage means comprising:

means for monitoring the magnitude of the voltage and the rate of change of the voltage on said energy storage means;

means responsive to said monitoring means for calculating a trigger value of voltage on said energy storage means in accordance with said rate of change of voltage on said energy storage means and a predetermined time interval



so that said calculated trigger value of voltage represents an amount of stored energy sufficient to sustain normal output power for a desired time interval; and

means responsive to said monitoring means and said calculating means for signalling imminent power supply failure when the voltage on said energy storage means reaches said calculated trigger value of voltage.

4,535,411

FIELD BALANCING APPARATUS

Bobby J. Blackburn, Columbus, and John M. Csokmay, Johnstown, both of Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio

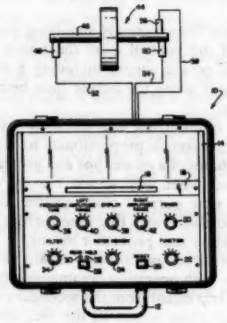
Filed Nov. 22, 1982, Ser. No. 443,541

Int. Cl.[3] G01M *7/00*

U.S. Cl. 364—508 **20 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 27 Pages)



1. Apparatus for balancing an identifiable rotor utilizing vibration responsive transducer means having vibration responsive output signals, rotation transducer means providing rotation responsive signals correspoding with a reference location of said rotor, and select utilization of a tral balance weight removably connectable with said rotor comprising:

means for receiving said vibration responsive output signals;

means for receiving said rotation responsive signals;

analyzer nework means responsive to said vibration responsive output signals and to said rotation responsive signals, and including means defining a filter synchronous with respect to said rotation responsive signals for deriving vector categorized signals corresponding with amplitudes and phase of vibration with respect to said reference location;

hold switch means for selectively deriving a data accept condition;

function switching means actuable to effect a balance condition;

memory switching means actuable to effect store and recall conditions;

display means for providing a visible readout of information;

a random access memory;

non-volatile random access memory means for retaining balance parameter data at discrete identifiable locations in the absence of applied electrical power;

processor means responsive to first said vector categorized signals derived from an initial rotation of said rotor when said function switching means is in said balance condition and said hold switch means is in said data accept condition for effecting the submittal of said first signals to said random access memory, responsive to second said vector categorized signals derived from a next rotation of said rotor with said trial balance weight connected therewith when said function switching means is in said balance condition and said hold switch means is in said data accept condition for effecting the submittal of said second signals to said random access memory, for computing balance correction parameters with respect to said first and second signals, for effecting the readout of balance correction information corresponding therewith at said display means, and subsequently responsive to actuation of said memory switching means to said store condition for effecting the storage of said computed balance correction parameters in said nonvolatile memory means.

4,535,412

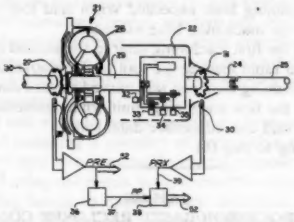
DRIVETRAIN TORQUE DETERMINATION USING TORQUE CONVERTER CHARACTERISTICS

Alf L. Cederquist, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 6, 1981, Ser. No. 319,156

Int. Cl.[3] G01L *3/00, 5/12;* **G06F** *15/20*

U.S. Cl. 364—511 **6 Claims**



1. In a system for determining the torque produced by a power generating device that drives a crankshaft and the torque applied to other components of a powertrain driven by the device comprising:

a torque converter having an impeller drivably connected to the crankshaft and a turbine driven from the impeller whose speed and torque may vary from those of the impeller;

an automatic transmission drivably connected to the turbine by a turbine shaft and to an output shaft, capable of producing multiple ratios, G, of the rotational speed of the output shaft to the speed of the turbine shaft in accordance with the ON-OFF state of pressure solenoids that activate and deactivate speed ratio control elements of the transmission;

means for sensing the state of the pressure solenoids and for determining from that state the speed ratio at which the transmission is operating;

first means for producing a first signal having a frequency that is proportional to the variable speed of the crankshaft;

second means for producing a second signal having multiple successive pulses whose frequency is proportional to the speed of the output shaft;

means for producing a high frequency signal having a frequency that is a selected multiple, M, of the frequency of the first signal;

first counter means operative to receive and count the number, C, of high frequency signal pulses occuring between successive second signal pulses; and

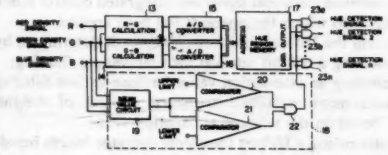
means for repetitively computing the impeller speed, NP, from the frequency of the first signal, the speed ratio, S, of the torque converter from the relationship $S=M\times G/C$ and the crankshaft torque, TP, from the relationship $TP=(NP/K)^2$, the computing means being provided with a data base that includes the values of the capacity factor, K, of the torque converter that corresponds to the computed values of the speed ratio of the torque converter, the computer impeller speed, the number C, and the transmission ratio, G, corresponding to the state of the pressure solenoids.

4,535,413

HUE IDENTIFYING APPARATUS

Kazuo Shiota, and Taizo Akimoto, both of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jun. 2, 1982, Ser. No. 384,238
Claims priority, application Japan, Jun. 18, 1981, 56-94350
Int. Cl.³ G03F *3/08*; G01J *3/46*
U.S. Cl. 364—526 **11 Claims**



8. A hue identifying apparatus comprising a means for creating an M-bit high order address signal and an N-bit low order address signal, wherein M and N each designate an arbitrary integer, from the difference between a combination of two of the red, green and blue density signals read out at each point on a color photographic film and from the difference between another combination of two of said density signals respectively; a hue region memory storing at each address the hue information based on a predetermined hue region defined with respect to a two-dimensional coordinate system wherein the coordinate axes represent quantized values of said differences, said address being designated by said high order and low order address signals; a means for detecting inadequate exposure based on the three-color density signals at each said point; and a means for obstructing the transfer of the hue information, which is output from said hue region memory, based on the output signal of said inadequate exposure detecting means.

4,535,414

POSITION INDICATING SYSTEM AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Feb. 26, 1982, Ser. No. 352,795
Int. Cl.³ G05B *19/19*
U.S. Cl. 364—561 **19 Claims**

1. Apparatus for indicating distance travelled between machine components comprising:

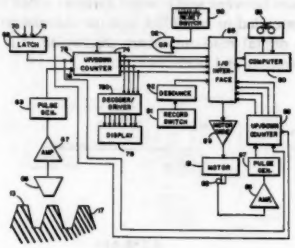
a first machine component,

a spirally threaded screw rotatably supported by said first machine component,

a second machine component operable to be power driven with respect to said first machine component,

thread containing means supported by said second component and adapted to be threadably assembled with the spiral thread of said screw,

means for power rotating said screw in synchronization with the movement between said first and second machine components,



a portion of the surface of said thread of said screw containing marker recordings therein,

means supported by said second machine component for sensing said marker recordings of said thread as said screw rotates and effects relative movement between said first and second components and generates variable output signals which vary as each marker of said thread is sensed, and

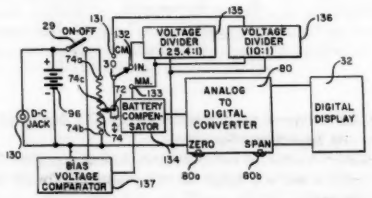
means for receiving and recording said output signals.

4,535,415

MEASUREMENT CONVERSION AND VISUAL DISPLAY INSTRUMENT

Edwin A. Hird, 10200 DeSoto Ave. #331, Chatsworth, Calif. 91311

Filed Jul. 6, 1976, Ser. No. 702,745
The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.
Int. Cl.³ G01B *3/08*
U.S. Cl. 364—562 **18 Claims**



1. A measurement conversion and visual display instrument comprising:

an extensible and resilient tape being cross-sectionally curved defining tape concave and tape convex surfaces;

a housing and tape follower, the housing having means mounting the tape follower consisting of first and second parallel rollers, the first roller having a firm periphery for transversely supporting the tape that is extensible from the housing, and the second roller having a rubberized periphery springily urging the tape against the first roller, and the second roller thereby rotating in response to the tape being longitudinally moved with respect to the housing;

a tip member having means being attached to the extensible, distal end of the tape;

a potentiometer mounted on the housing and connected across a voltage source, and the potentiometer including a

rotatable shaft coupled whereby the potentiometer responds electrically, with analog signals, to movements of the tip member, and the tip member and the housing including measurement contact surfaces, and zero and span distances between said contact surfaces synchronized with national measurement standards; and

calculator means electrically coupled to convert said analog signals to digital signals and mathematically specify units of measurements and portions thereof relative to the distances between said contact surfaces when the tip member is extended or retracted, and the calculator means including digital read-out means displaying said units of measurements and portions thereof.

4,535,416

ELECTRONIC COMPACT FUNCTION CALCULATOR

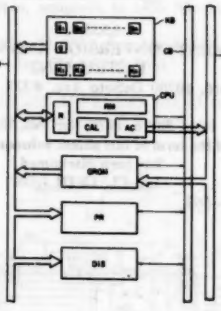
Kuniomi Kano, Yokohama; Hideo Fushimoto; Kazumi Sekine, both of Kawasaki; Akira Miyagawa; Osamu Hirata, both of Tokyo, and Yoshiaki Nishimuro, Hachiohji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 350,061, Feb. 18, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 681,065

Claims priority, application Japan, Mar. 9, 1981, 56-32443

Int. Cl.³ G06F *15/02*

U.S. Cl. 364—715 **2 Claims**



1. An electronic apparatus for graphically displaying a function, said apparatus comprising:

memory means for independently storing a graphic function pattern and a graphic coordinate pattern for the function pattern;

input means for entering numerical values associated with a characteristic of the function pattern stored in said memory means, the characteristic representing the relative position of the function pattern and the coordinate pattern stored in said memory means;

processor means connected to said input means and responsive to the numerical values entered thereby for determining the relative positions of the function pattern and the coordinate pattern represented by the characteristic;

display means for displaying the function pattern and the coordinate pattern; and

control means connected to said processor means and responsive to the relative positions determined thereby for relatively positioning the function pattern and the coordinate pattern in accordance with the characteristic for display by said display means.

4,535,417

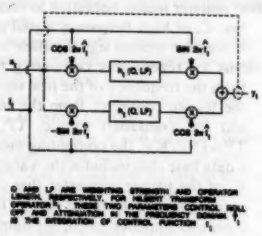
METHOD AND APPARATUS FOR DIGITAL TIME-VARIANT FILTERING

Kenneth L. Peacock, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Filed Dec. 23, 1982, Ser. No. 452,474

Int. Cl.³ G06F *15/31*

U.S. Cl. 364—724 **15 Claims**



Q AND LF ARE WEIGHTING STRENGTH AND OPERATOR LENGTH, RESPECTIVELY. FOR HILBERT TRANSFORM OPERATOR T. THESE TWO PARAMETERS CONTROL ROLL OFF AND ATTENUATION IN THE FREQUENCY DOMAIN. f_c IS THE INTEGRATION OF CONTROL FUNCTION f_c.

1. A method for processing a digital electrical signal having a time-varying character, comprising the steps of:

selecting a digital time-varying control function signal for controlling cutoff frequency;

discretely integrating the selected control function signal;

combining the electrical signal with the integrated control function signal;

applying a Hilbert transform operator to the combined electrical signal and integrated control function signal; and

extracting a time-variant filtered electrical signal from the combined electrical signal and integrated control function signal to which the operator has been applied;

wherein the Hilbert transform operator is determined by:

selecting a roll-off interval for time-variant filtering;

selecting an attenuation value for time-variant filtering;

determining a Hilbert transform stength of weighting based on the selected attenuation value;

determining a Hilbert transform operator length based on the selected roll-off interval and the attenuation value; and

determining the Hilbert transform operator based on the strength of weighting and the operator length.

4,535,418

DATA CARRIER CONTROLLED DATA PROCESSING

Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Niedere Str. 36, D-7730 Villingen, both of Fed. Rep. of Germany

PCT No. PCT/EP82/00060, § 371 Date Nov. 17, 1982, § 102(e) Date Nov. 17, 1982, PCT Pub. No. WO82/03288, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 23, 1982, Ser. No. 445,378

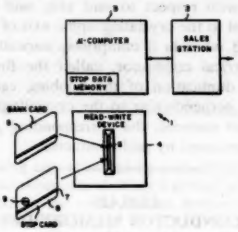
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1981, 3111353

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—900 **5 Claims**

1. A data carrier controlled data processing system for receiving a first data carrier having data stored thereon relating to another data carrier to be received by said system, said system including first means for authenticating the validity of said first data carrier, second means for comparing a personal code of the user with data on said first data carrier to determine if the user is authorized, and third means for reading data relating to another data carrier from said first data carrier into

said system if both the first data carrier is authenticated as being a valid data carrier by said first means and the user



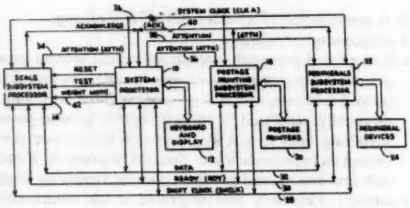
thereof has been determined to be authorized by said second means.

4,535,419

SYSTEM AND METHOD FOR COMPUTING FRACTIONAL POSTAGE VALUES

Daniel F. Dlugos, Huntington, and Edward P. Daniels, Bridgeport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 22, 1982, Ser. No. 436,122
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **13 Claims**



1. An apparatus for determining postage values for items to be mailed, comprising:

(a) means for determining the weights of said items;

(b) data entry means for entering data necessary to determine the postage applicable to said items, said data including data defining the class of service applicable to each of said items;

(c) processor means connected to said weight determining means and said data entry means for determining the postage value applicable to each of said items, said processing means further comprising memory means for storing tables of data defining applicable postage rates, selection among said tables being made in terms of said determined weights and said entered data, each of said tables corresponding to a particular one of said classes of service, and each of said tables including additional data more precisely defining said postage rate defining data in that table, and said additional data in each of said tables including data defining the decimal point location in the postage values determined from that table; and,

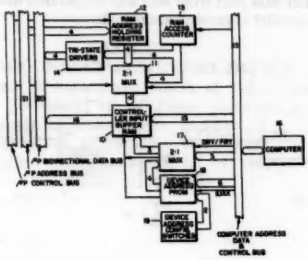
(d) said processor means responding to said determined weights and said entered data to select and output the appropriate postage value from said tables for each of said items, the decimal point location in said output values being determined in accordance with said additional data.

4,535,420

CIRCULAR-QUEUE STRUCTURE

Anthony K. Fung, Fountain Valley, Calif., assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 79,208, Sep. 26, 1979, abandoned. This application Jun. 18, 1982, Ser. No. 389,823
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—900 **18 Claims**



1. An interfacing system comprising,

multiplexer means (11) for selectively passing signals therethrough,

memory means (10) having the address terminals thereof connected to the output terminals of said multiplexer means (11) to receive signals therefrom,

first memory addressing means (13) connected to said multiplexer means to supply address signals thereto,

second memory addressing means (12) connected to said multiplexer means to supply address signals thereto,

input means (16) for supplying information to be stored in said memory means at a location addressed by said first memory addressing means via said multiplexer means,

output means (20) for retrieving information from said memory means at a location addressed by said second memory addressing means via said multiplexer means, and

control means (404) connected to said first memory addressing means (13) and to said output means (20) in order to monitor the address signals produced by said first memory addressing means (13) so as to prevent said output means (20) from operating on information which was retrieved from said memory means (10) at the same time as said input means (16) supplied information to said memory means (10) which information retrieval condition is indicated by a change in the address signals monitored at said first memory addressing means (13).

4,535,421

UNIVERSAL REAL TIME TRANSPARENT ASYNCHRONOUS SERIAL/ECHOPLEX CONVERTER

Edward C. Duwel, Trumbull, and John H. Soderberg, Stratford, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 5, 1983, Ser. No. 510,792
Int. Cl.³ G06F *5/04*
U.S. Cl. 364—900 **10 Claims**

1. Transparent interface apparatus for providing real time data communication between a first device utilizing serial communication and a second device utilizing echoplex communication comprising:

a first microprocessor having a serial data port and a first parallel data port;

a second microprocessor having a second parallel data port and an echoplex data port;

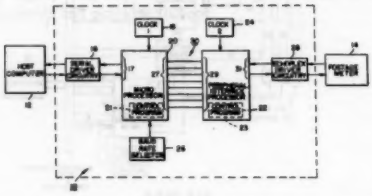
a parallel communication path coupling said first and second parallel data ports;

means within said first microprocessor for converting serial data from said serial data port into a parallel format and for transferring this parallel formatted data to said second paral-

lel data port from said first parallel data port across said parallel communication path;

means within said second microprocessor for converting parallel data from said second parallel data port into an echoplex format and for outputting said echoplex formatted data from said echoplex data port;

means within said second microprocessor for converting echoplex data from said echoplex data port into a parallel format and for transferring this parallel formatted data to said first parallel data port from said second parallel data port across said parallel communication path;



means within said first microprocessor for converting parallel data from said first parallel data port into a serial formal and for outputting this serial formatted data from said serial data port; and

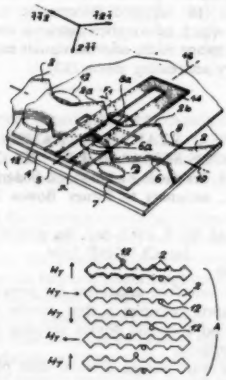
means for prioritizing data transfer between said first and second microprocessors, said prioritizing means awarding first priority to echoplex data to be transferred from said echoplex port for output from said serial data port and second priority to serial data to be transferred from said serial port for output from said echoplex data port.

4,535,422

MAGNETIC BUBBLE MEMORY WITH UNIMPLANTED MOTIFS

Hubert Jouve, Biviers, and Joël Magnin, Saint Martin d'Heres, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 22, 1983, Ser. No. 506,688
Claims priority, application France, Jun. 29, 1982, 82 11407
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—36 **25 Claims**



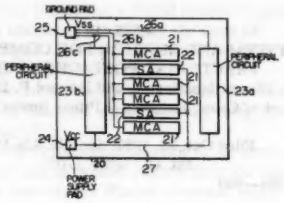
1. A magnetic bubble memory having a first layer of monocrystalline magnetic material with at least one crystallographic axis having the property of being a planar easy magnetization axis, whereby said first layer has groups of unimplanted, contiguous and aligned motifs, called first motifs, permitting the propagation of the bubbles in a second magnetic layer, positioned below the first magnetic layer, said first motifs being shaped in such a way that two cavities are defined between two first adjacent motifs, wherein each group of first motifs has an axis such that the first motifs of said group are arranged symmetrically with respect to said axis, said groups being arranged parallel to the crystallographic axis of the first layer of material, and wherein it comprises, associated with each group, an electrical conductor, called the first conductor, permitting the duplication of the bubbles, each conductor being arranged perpendicular to the crystallographic axis of the first layer of material, the corresponding group of first motifs being tranversed by said conductor.

4,535,423

SEMICONDUCTOR MEMORY DEVICE

Shigeki Nozaki, Kawasaki, and Hatsuo Miyahara, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 7, 1982, Ser. No. 447,660
Claims priority, application Japan, Dec. 7, 1981, 56-196465
Int. Cl.³ G11C *5/10*
U.S. Cl. 365—51 **6 Claims**



1. A semiconductor memory device comprising:

a semiconductor substrate;

a first ground-potential supplying line and second ground-potential supplying lines having impedances and formed on said substrate, said first ground-potential supplying line physically separated from said second ground-potential supplying lines except at a common connection portion having an impedance lower than the impedance of each of said first and second ground-potential supplying lines;

a plurality of memory cells integrated on said semiconductor substrate, each of said memory cells having a capacitor for storing data, said capacitor having a storage electrode and an electrode opposite to said storage electrode, said opposite electrode being connected to said first ground-potential supplying line; and

one or more peripheral units integrated on said semiconductor substrate and arranged on the periphery of said memory cells, said peripheral units being connected to said second ground-potential supplying lines.

4,535,424

SOLID STATE THREE DIMENSIONAL SEMICONDUCTOR MEMORY ARRAY

Lee R. Reid, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 3, 1982, Ser. No. 384,451
Int. Cl.³ G11C *17/00*
U.S. Cl. 365—63 **6 Claims**

1. A three-dimensional memory array, comprising:

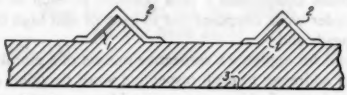
(a) a plurality of substantially planar semiconductor substrates;

(b) at least one of said substrates having memory circuits fabricated upon a surface thereof;

(c) at least one of said substrates having a plurality of integral elevated portions projecting from a surface thereof, at least one of said elevated portions characterized by forma-

tion by orientation-dependent etching of said substrate; and

(d) said substrates oriented parallel and stacked together,



said stacking characterized by said elevated portions of a first of said substrates abutting a second of said substrates, said abuttings the only contact between said first and second substrates.

4,535,425

HIGHLY INTEGRATED, HIGH-SPEED MEMORY WITH BIPOLAR TRANSISTORS

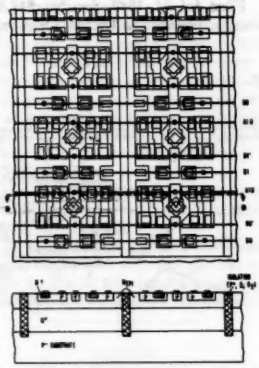
Siegfried K. Wiedmann, Stuttgart, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 7, 1982, Ser. No. 375,896

Claims priority, application European Pat. Off., May 30, 1981, 81104145

Int. Cl.³ H01L *27/04*; H03K *19/091*; G11C *11/40*

U.S. Cl. 365—156 **8 Claims**



1. A memory with MTL memory cells each comprising:

a first address line;

a pair of integrated transistor structures connected as switching transistors of a flip-flop circuit, each transistor structure comprising:

a first semiconductor region of one conductivity type and constituting the emitter connected to said address line;

a second semiconductor region of the opposite conductivity type and within said first region and constituting the base; and

a third semiconductor region of said one conductivity type and within said second region and constituting the collector;

a primary injector provided in common for at least two adjacent memory cells, said injector being formed by at least one fourth semiconductor region of said opposite conductivity type provided adjacent said second semiconductor region and adapted to feed an injection current into said second semiconductor region in a first direction;

a pair of bit lines; and

a pair of bit line injectors provided in common for at least two adjacent memory cells, said pair of bit line injectors being formed by a fifth and sixth semiconductor region of said opposite conductivity type and each being provided adjacent one of said second semiconductor regions and adapted to collect part of said injection current via said second semiconductor region in a second direction different from said first direction;

whereby through an angular injection course via the base region of the respective conductive switching transistor of said pair of switching transistors the memory cell is provided with a low series resistance signal path from the primary injector to the respective bit line injector.

4,535,426

SEMICONDUCTOR MEMORY DEVICE

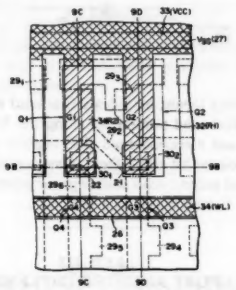
Shoji Ariizumi; Makoto Segawa, both of Tokyo, and Fujio Masuoka, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 14, 1983, Ser. No. 504,157

Claims priority, application Japan, Jul. 19, 1982, 57-125344

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—182 **34 Claims**



1. A semiconductor memory device including memory cells which have bistable flip-flop circuits formed of cross-coupled transistors, comprising:

a semiconductor substrate;

a first drain area of one of said cross-coupled transistors formed at a given position on said substrate, said first drain area being of a first conductivity type;

a second drain area of another of said cross-coupled transistors being so formed in said substrate that said second drain area is arranged close to said first drain area, said second drain area being of said first conductivity type; and

a source area of said cross-coupled transistors being so formed in said substrate that said source area surrounds said first and second drain areas from three sides of a location in which said cross-coupled transistors are formed, said source area being of said first conductivity type.

4,535,427

CONTROL OF SERIAL MEMORY

Ching-Lin Jiang, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

Filed Dec. 6, 1982, Ser. No. 447,348

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—205 **6 Claims**

1. An integrated circuit serial memory comprising:

an array of memory cell elements;

writing means for writing data sequentially into said array;

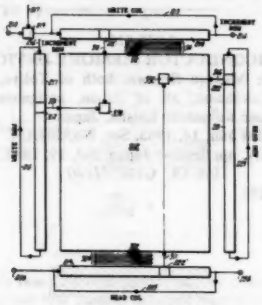
reading means for reading data sequentialy out of said array; and

control means for setting flags indicating memory-full and memory-empty states;

characterized in that:

said array comprises a two dimensional array of non-shifting memory cells, having an X and a Y dimension;

said writing means includes a first write shift register carrying a first write pointer bit along the X dimension of said array and a second write shift register carrying a second write pointer bit along the Y dimension of the array, which first and second write shift register pointer bits point in the X and Y dimensions to a write cell; and



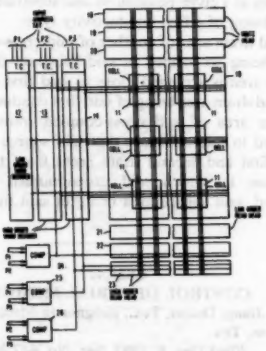
said reading means includes a first read shift register carrying a first read pointer bit along the X dimension of said array and a second read shift register carrying a second read pointer bit along the Y dimesion of said array, which first and second read shift register pointer bits point in the X and Y dimensions to a read cell.

4,535,428

MULTI-PORT REGISTER IMPLEMENTATIONS

Anatol Furman, Jericho, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 10, 1983, Ser. No. 474,071
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—230 **10 Claims**



1. In a memory array having cells each of which is separately addressable from a plurality of write lines and is readable by a plurality of sets of bit lines, comprising:

a memory cell array, each cell of which is separately addressable from a plurality of write lines and readable by a plurality of sets of bit lines,

a low order word decoder and at least one high order word decoder coupled to each cell of the array,

a low order read head and at least one high order read head coupled to each cell of the array, via said plurality of bit lines, the number of said high order read heads being equal in number to the number of high order word decoders,

at least one multiplexer circuit coupled to each of said high order read heads,

address comparison means coupled to each of said high order word decoders and to each of said high order read heads and

means for applying a respective one set of a plurality of sets of addresses to each respective word decoder, and all of said sets of addresses to said address comparison means,

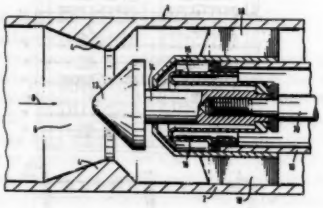
said address comparison means comparing said sets of addresses.

4,535,429

APPARATUS FOR SIGNALLING WITHIN A BOREHOLE WHILE DRILLING

Anthony W. Russell, and Michael K. Russell, both of Cheltenham, England, assignors to NL Sperry-Sun, Inc., Stafford, Tex.

Filed Jul. 11, 1983, Ser. No. 512,308
Claims priority, application United Kingdom, Jul. 10, 1982, 8220119
Int. Cl.³ G01V *1/40*
U.S. Cl. 367—85 **16 Claims**



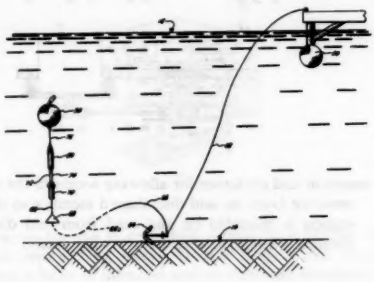
1. A down-hole signal transmitter for a mud-pulse telemetry system, comprising a flow constrictor defining a throttle orifice for the mud flow passing along a drill string, a throttling member displaceable with respect to the throttle orifice to vary the throughflow cross-section of the throttle orifice, a pump for displacing the throttling member against the mud flow, and valve means switchable between a first state in which the throttling member is displaceable by the output pressure of the pump against the mud flow and a second state in which said output pressure is relieved so as to enable the throttling member to be moved in the direction of the mud flow by the pressure of the mud flow acting on the throttling member, whereby the pressure of the mud flow may be modulated, wherein the valve means comprises a hydraulic amplifier incorporating a main, pressure relief valve and a subsidiary, control valve for controlling a main flow of fluid through the main valve by acting on a subsidiary flow of fluid of relatively low magnitude, the pressure relief valve being adapted to open when the control valve is opened and comprising a spring-biased valve member having a bore extending therethrough for the subsidiary flow of fluid towards the control valve, and the valve member being movable by pressure of fluid acting against the spring force when the control valve is opened, to open the pressure relief valve.

4,535,430

SUBSEA ACOUSTIC RELOCATION SYSTEM

Douglas A. Cochrane, Jr., and Fred W. Styer, both of Lafayette, La., assignors to Cochrane Subsea Acoustics, Inc., Lafayette, La.

Filed Jul. 7, 1982, Ser. No. 395,918
Int. Cl.³ B63B 21/52
U.S. Cl. 367—133 10 Claims



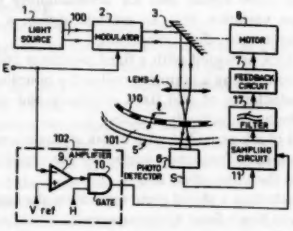
1. A method of undersea relocation comprising the steps of:
a. positioning a weighted line containing canister near a desired object on the seabed to be relocated at a future designated relocation time;
b. attaching one end of the line to the weighted canister and the other free end to a buoyed structure which can lift the canister line free end, but having a buoyancy value insufficient to overcome the weight of the line canister;
c. attaching an anchor pennant line to the line in the canister by using an intermediate anchor pennant line having a weight per foot greater than the weight per foot of the canister line but less than the weight per foot of the anchor pennant line;
d. securing the buoyed structure to the canister with a removable connection that can be broken with an acoustic signal; and
e. emitting an acoustic signal at the designated relocation time, causing the buoyed structure and the free end of the canister line to rise to the water surface area as line dispenses from the line canister on the seabed.

4,535,431

OPTICAL TRACK FOLLOWER DEVICE WITH SAMPLING

Claude Bricot; Jean Louis Gérard, and Michel Audoin, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 10, 1982, Ser. No. 406,917
Claims priority, application France, Aug. 14, 1981, 81 15765
Int. Cl.³ G11B 7/00, 21/10
U.S. Cl. 369—44 15 Claims



1. A tracking device for use in an optical data transcription system, said system including a data storage medium for storing data and having a reference surface wherein a set of radially adjacent track elements are pre-engraved, said tracking device causing an illuminating spot to selectively follow any one of said adjacent track elements, said illuminating spot corresponding to an area of impact of a focussed beam of radiant energy impinging on said reference surface, said tracking device comprising:

actuator means for displacing said illuminating spot transversely of said radially adjacent track elements;

photodetector means sensing the radiant energy emerging from said area of impact for generating from optical interaction with a scanned one of said radially adjacent track elements a signal representative of the error of tracking of said illuminating spot in relation with the radial axis of said scanned one track element; and

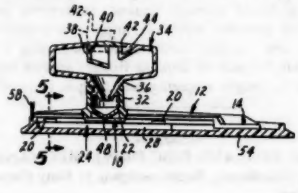
feedback loop means for controlling said actuator means with said signal, said feedback loop means including means for blanking out the transmission of the values taken by said signal while scanning non-contiguous portions, of said scanned one track element, respectively allotted for post recording of said data, thereby preventing unreliable control of said actuator means arising from the scanning of said non-contiguous portions, each of said radially adjacent track elements being provided with gaps, intermediate said non-contiguous portions, having pre-engraved tracking items.

4,535,432

DEVICE FOR CLEANING A PHONOGRAPH RECORD

Gerald J. Niles, and Thomas A. Sandberg, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 1, 1984, Ser. No. 585,346
Int. Cl.³ G11B 3/58
U.S. Cl. 369—72 20 Claims



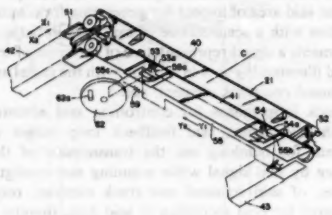
1. A phonograph-record cleaning device comprising an elongated arm, one end of which is formed to engage the spindle of a phonograph tuntable, an elongated porous cleaning pad mounted on the underside of the arm and extending radially across the working surface of a record when positioned for cleaning, a rotatable member carried by the upperside of the arm, a cleaning-fluid reservoir carried by the rotatable member, and the rotatable member and arm together forming a fluid passage from the reservoir to the cleaning pad, wherein the improvement comprises:

the fluid capacity of each of the reservoir and pad barely wets one entire working surface of the largest record to be cleaned, and the reservoir is mounted in the rotatable member for pivotable movement between a fill position affording manual filling of the reservoir, and a dump position at which the contents of the reservoir will be poured onto the porous cleaning pad.

4,535,433
APPARATUS FOR PLAYING BACK ROTATING RECORDING MEDIUMS

Toru Kishi, Zama, and Takashi Saito, Ayase, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Jan. 17, 1984, Ser. No. 571,653
Claims priority, application Japan, Jan. 18, 1983, 58-6016
Int. Cl.³ G11B 17/04, 1/00
U.S. Cl. 369—77.2 8 Claims



1. An apparatus for playing back a rotating recording medium removably housed in a case including a jacket for containing the rotating recording medium and a lid plate closing a slot in the jacket, said apparatus comprising:

(a) turntable for placing the rotating recording medium thereon;

(b) a signal pickup head for reproducing signals recorded on the rotating recording medium on said turntable;

(c) means including a support movable selectively into an elevated position for supporting the rotating recording medium above said turntable and into a lowered position for placing the rotating recording medium on said turntable;

(d) a jacket opener movable over and across said turntable in response to being pushed by the case when the case is inserted into a position over said turntable, said jacket opener comprising a pair of beams for opening the slot in the jacket, one of said beams having a pair of ledges spaced from each other; and

(e) locking means responsive to operation of said means for supporting, for locking said jacket opener at laterally spaced positions thereon against movement over and across said turntable when said support is in said lowered position, said locking mechanism comprising a locking plate having a pair of locking fingers spaced from each other for lockingly engaging said ledges, respectively.

4,535,434
OPTICAL DISC AND DISC DRIVE MECHANISM

Yoshio Kishi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,904
Claims priority, application Japan, Mar. 27, 1980, 55-39434
Int. Cl.³ G11B 7/00, 23/02
U.S. Cl. 369—111 4 Claims

4. A radiation-sensitive record cartridge comprising:

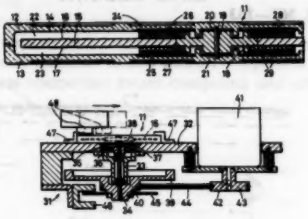
a disc-shaped member having a radiation-sensitive recording layer on at least one planar side thereof;

an enclosure spaced from and completely surrounding said disc-shaped member;

means for supporting said disc-shaped member within said enclosure and for enabling rotation of said disc-shaped member around an axis extending through the center of and perpendicular to the plane of said disc-shaped member;

means for coupling said disc-shaped member to drive means which is outside said enclosure, said coupling means comprising a magnetically influenceable means attached to said disc-shaped member and rotatable magnetic drive means situated outside said enclosure which generates a magnetic field for interaction with said magnetically influenceable means;

means for aligning said enclosure and the disc shaped member therein with the said disc shaped member and said drive means in coaxial condition; and

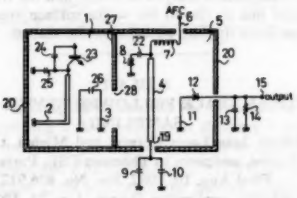


means in said enclosure for allowing access to the radiation-sensitive layer on said disc-shaped member so that information is recorded on and read from said disc-shaped member through said access allowing means.

4,535,435
CAPACITANCE DETECTOR FOR VIDEO DISK

Akiyuki Yoshisato, and Kohta Iijima, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jun. 29, 1982, Ser. No. 393,292
Claims priority, application Japan, Jun. 30, 1981, 56-97306
Int. Cl.³ G11B 9/00, 3/00
U.S. Cl. 369—126 3 Claims



1. In a capacitance detector for detecting a capacitance variation recorded on a video disk by converting an FM-modulated video signal, and for demodulating the detected capacitance variation into an electric signal; a capacitance detector for a video disk comprising:

a first block provided with a fixed oscillator and a coupling loop comprising a coupling coil and a coupling capacitor, the inductance of said fixed oscillator and said coupling loop being inductively coupled,

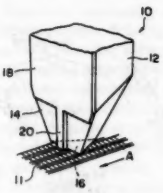
a second block provided with a disk stylus resonator having its resonance frequency varied by the capacitance variation of the video disk, and

means including a shield plate separating the components of said first block from the components of said second block and having a coupling window for inductively coupling said coupling loop of said first block with a resonant inductance of said disk stylus resonator of said second block through said coupling window.

4,535,436
STYLUS HAVING A GRAPHITE ELECTRODE

Hideaki Takehara, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Division of Ser. No. 268,888, Jun. 1, 1981, Pat. No. 4,409,712.
This application Jun. 14, 1983, Ser. No. 504,223
Claims priority, application Japan, May 30, 1980, 55-72517
Int. Cl.³ G11B 9/06
U.S. Cl. 369—173 6 Claims

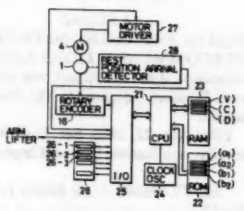


1. A stylus for use in recording signals on a lacquer disc record or reproducing signals from a lacquer disc record, comprising a body of diamond and an electrode attached to a surface of said diamond body, said electrode comprising a layer of graphite which is integrally formed with the diamond body, said graphite layer being formed by heating said diamond body in an environment of vacuum or inert gas containing a small amount of oxygen at an elevated temperature in a range from 1100° C. to 1500° C.

4,535,437
PICKUP ARM DRIVING CONTROL SYSTEM WITH REPEAT PLAYBACK FUNCTION

Satoshi Hiranuma, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1982, Ser. No. 450,296
Claims priority, application Japan, Dec. 25, 1981, 56-209285
Int. Cl.³ G11B 3/36, 19/14, 17/06
U.S. Cl. 369—223 1 Claim



1. A pickup tonearm drive system applicable to a record disc player comprising:

drive means for the pickup tonearm;

a pulse generator for generating a pulse at every predetermined distance of movement of a pickup tonearm;

a counter for obtaining a count representative of the current position of the tonearm compared to a rest position by upcounting the pulses from said generator in a first-direction movement of the tonearm and downcounting the pulses from said generator in a second direction movement of the tone arm which is reverse in direction to the first direction;

a repeat key for issuing a repeat signal upon the actuation thereon; and

a processor and memory programmed by the steps of:

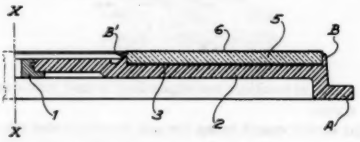
in response to the repeat signal first issued from said repeat key after the playback operation of the tonearm has started, memorizing a first count of said counter as a repeat start position information,

in response to the repeat signal secondly issued from said repeat key, (a) memorizing a second count of said counter as a repeat end position information and also controlling the tonearm to terminate the playback operation, and (b) controlling the tonearm to repeatedly perform a playback operation between the positions represented by said first and second counts by actuating the drive means to drive the tonearm according to comparison of the count of said counter with the memorized first and second counts.

4,535,438
TURNTABLE PLATTER FOR RECORD PLAYERS

Liberto Massarelli, Vasto, and Luigi Capriotti, Porto d'Ascoli, both of Italy, assignors to Societä Italiana Vetro-SIV-S.p.A., Italy

Filed Aug. 13, 1982, Ser. No. 407,734
Claims priority, application Italy, Sep. 2, 1981, 23743 A/81
Int. Cl.³ G11B 3/60
U.S. Cl. 369—264 1 Claim



1. A turntable platter comprising:

a base disk having a center of rotation, a lower surface and an upper surface, said disk being made of plastic and including inner and outer edges extending upwardly from said upper surface defining an annular trough therebetween, said disk having an outer peripheral edge extending lower than a plane containing said lower surface of said disk, said outer peripheral edge being transparent;

a glass layer member engaged with said upper surface of said disk in said annular trough and covering at least a portion of said top surface, said glass layer member being annular in shape and being positioned on an outer portion of said upper surface of said disk spaced away from said center of rotation, a portion of said upper surface of said disk adjacent said center of rotation being in a lower plane than a plane containing an upper surface of said glass layer member;

adhesive between said base disk and said glass layer member for connecting said glass layer member to said disk; and

an electrically conductive thin layer disposed on said upper surface of said glass layer and made of one of dielectric and metallic material and having a thickness which is less than micron.

4,535,439
OPTICAL HAVING INDEX MARK AND SECTOR MARK

Isao Satoh, Neyagawa; Tomio Yoshida, Katano; Shunji Ohara, Higashiosaka, and Kenji Koishi, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 24, 1982, Ser. No. 444,456
Claims priority, application Japan, Dec. 1, 1981, 56-193970; Dec. 4, 1981, 56-196044
Int. Cl.³ G11B 7/24, 17/22, 7/00
U.S. Cl. 369—275 4 Claims

1. An optical recording and reproducing disc for optically recording and reproducing information, and comprising:

a data track section including groove-like guide tracks;

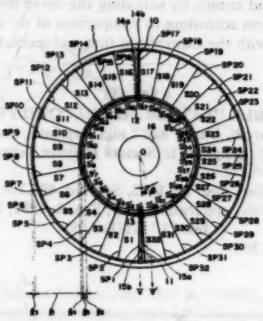
said groove-like guide tracks being divided by sector separating zones into track address zones formed by groove-like pits and a plurality of information recording sectors;

said sector separating zones being constituted by repetition

of concave and convex pit portions formed by a large number of approximately circular pits and elongated uniform pits of approximately the same length;

an index track section formed at an outer side or an inner side of said data track section;

said index track portion having index marks at positions corresponding to said track address zones, and sector



marks at positions corresponding to said sector separating zones;

said sector marks being formed by elongated arcuate uniform pits so as to be concentrically positioned with respect to said groove-like guide tracks; and

said index marks being formed by using at least two of said sector marks.

4,535,440

OPTICAL MULTIPLEXER

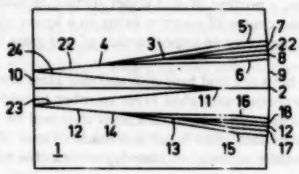
Lothar Mannschke, Eckental, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 20, 1983, Ser. No. 515,701

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1982, 3230657

Int. Cl.³ H04B 9/00

U.S. Cl. 370—1 **4 Claims**



1. An optical multiplexer formed by branching light-guiding tracks which are embedded in the surface of a solid body, the improvement therein comprising a reflective side in said solid body, a light-guiding central track in said solid body, said central track being diverted symmetrically into at least two angled tracks connecting to said central track from opposite sides of said central track at a joining point along the length of said central track, said angled tracks extending to said reflective side of said solid body and turning back and extending to the opposite side of said body, said angled tracks having successive branches along their respective lengths, each branch including a pair of branch tracks opening from opposite sides into said respective angled track at the same angle, and at the same longitudinal position along said angled track, said branches being separated along the length of said respective angled tracks.

4,535,441

COMMUNICATION SYSTEM FOR STATIONARY AND MOBILE SUBSCRIBERS

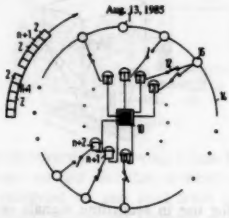
Heinz Schwaertzel, and Hans Unterberger, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 30, 1979, Ser. No. 61,899

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842632

Int. Cl.³ H04B 9/00

U.S. Cl. 370—4 **8 Claims**



1. A communication system for stationary and mobile subscribers, comprising; a ring circuit for interconnecting a plurality of subscriber stations having input-output devices, a switch located at each subscriber station for selectively interconnecting said station with said ring circuit, said subscriber stations also being interconnected by means of a conventional switching network, a transceiver station connected to said ring circuit, said transceiver station having a transmitter and a receiver for carrying on two-way communication with a mobile subscriber terminal device; whereby a call to a subscriber is switched onto the ring circuit via said switch at the subscriber's station and is transmitted wirelessly with an address allocated to the called subscriber, which call is received by a mobile subscriber terminal device corresponding to said address; and whereby two-way communication may be carried out between the subscriber and the originator of said call.

4,535,442

DIGITAL SWITCHING NETWORK FOR TELECOMMUNICATIONS EXCHANGE

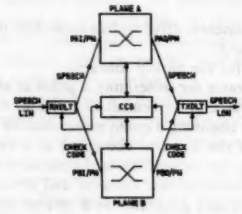
Thomas S. Madders; John W. Ansell, and Alexander S. Philip, all of Dorset, England, assignors to The Plessey Company plc, Ilford, England

Filed Apr. 22, 1983, Ser. No. 487,871

Claims priority, application United Kingdom, Apr. 24, 1982, 8211924

Int. Cl.³ H04T 1/16; H04Q 11/04

U.S. Cl. 370—13 **9 Claims**



1. A digital telecommunications exchange handling information samples in time division multiplex form carried by incoming and outgoing junction paths, the exchange comprising:

a receive interface for each incoming junction path;

a transmit interface for each outgoing junction path;

first and second time division multiplex switch networks, each network being controlled by a common control system to provide identical selectable connections in each network between any one of the receive interfaces and any one of the transmit interfaces on a time division multiplex basis;

each receive interface includes error code generating means for generating a first error indicating code dependent upon each information sample received thereby and for generating a second error indicating code which is a function of said first error indicating code, said first and second error indicating codes defining a checkcode, and each receive interface includes information sample and checkcode insertion means arranged to pass to one of the switching networks said information sample and to the other switching network said checkcode;

each transmit interface includes error detection means for comparing the first error indicating code with the second error indicating code both defining said checkcode received via said other switching network and includes means for validating the information sample received via said one of the switching networks against said first error indicating code after the successful comparison by said means for comparing to detect errors in said information samples received via said one of the switching networks; and

said common control system having means for selecting the switching network dependent upon said means for comparing and said means for validating.

4,535,443

TERMINAL ARRANGEMENT FOR A DUPLEX TRANSMISSION SYSTEM

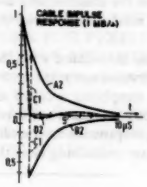
Geerlof J. Korevaar, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 15, 1983, Ser. No. 504,101

Claims priority, application Netherlands, Jun. 16, 1982, 8202438

Int. Cl.³ H04B *1/58, 3/04*

U.S. Cl. 370—24 **2 Claims**



1. A terminal for a transmission system having a duplex transmission path for transmitted and received digital signals, comprising:

a transmitter which includes a pulse-shaping equalizer for generating a number (n) of variably delayed versions of the digital signal to be transmitted, multiplying such versions by respective correction factors ($\alpha 1, \alpha 2, \ldots \alpha_n$) and adding such multiplied versions to the digital signal to be transmitted, thereby predistorting such digital signal;

a receiver which includes an adaptive quantized feedback equalizer having adaptively adjustable coefficients (C1, C2, . . . C_n);

and converter means coupling said transmitter equalizer to said receiver equalizer, said converter means being adapted to convert the adaptively adjustable coefficients (C1, C2, . . . C_n) of the receiver equalizer into the correction factors ($\alpha 1, \alpha 2, \ldots \alpha_n$) for the pulse-shaping transmission equalizer in accordance with recursive expressions which signify minimum intersymbol interference between successive pulses in received digital signals.

4,535,444

DIGITAL SWITCHING EXCHANGE FOR TELEPHONE SYSTEMS

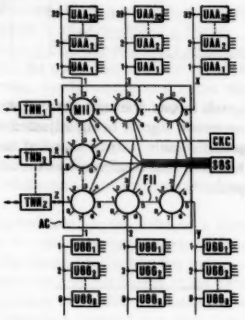
Vincenzo Falzone, and Marcello Tommasi, both of Rome, Italy, assignors to Italtel Societa Italiana Telecomunicazioni S.p.A., Milan, Italy

Filed Jan. 22, 1982, Ser. No. 341,671

Claims priority, application Italy, Jan. 30, 1981, 19414 A/81

Int. Cl.³ H04J *3/02;* **H04Q** *11/04*

U.S. Cl. 370—58 **23 Claims**



1. A digitally operating telephone exchange comprising:

a switching assembly (AC) including a multiplicity of mutually identical routing modules (MII) interconnected by PCM lines (FII) giving each module direct access to some of the other modules;

first interface means (UAA) connected to certain of said routing modules and providing same with access to respective sets of subscriber lines;

second interface means (TNN) connected to other of said routing modules providing same with access to respective digital trunks extending to remote exchanges;

third interface means (UGG) connected to further of said routing modules and providing same with access to respective analog trunks;

centralized oscillation-generating means (GC) connected to said first interface means for supplying same with ringing current and with a modulable audio-frequency signalization carrier;

supervisory processing means (SGS) connected to all said routing modules and to said second interface means for controlling the operations thereof; and

centralized timing means (CKC) connected via a data channel to all said routing modules and to said second interface means for synchronizing the operations thereof;

each routing module including circuitry for receiving incoming messages from PCM lines and interface means connected thereto and for transmitting outgoing messages to the PCM lines and to the interface means connected thereto.

4,535,445

CONFERENCING SYSTEM ADAPTIVE SIGNAL CONDITIONER

Michael S. Lane, Colts Neck, and Steven D. Scholbrock, Freehold, both of N.J., assignors to AT&T Information Systems, Holmdel, N.J.

Filed Jun. 16, 1983, Ser. No. 505,106

Int. Cl.³ H04Q *11/04*

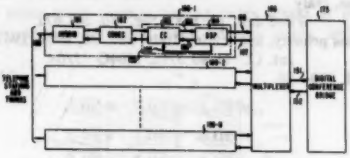
U.S. Cl. 370—62 **15 Claims**

1. A speech conditioning arrangement adapted for use in a transmission line having a transmit channel for receiving signals from a first conferee and a receive channel for receiving signals from at least one other conferee comprising

means for identifying signals contained on said transmit

channel as being either transmit speech signals or transmit nonspeech signals, and

means for adjusting the level of said transmit speech signals and said transmit nonspeech signals and for supplying the



resulting signals to said transmit channel, the level of said transmit nonspeech signals being adjusted to the level of transmit speech signals priorly supplied to said transmit channel when said first conferee was the last of said conferees to speak.

4,535,446

DIGITAL TRANSMISSION SYSTEMS

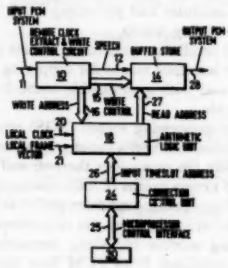
Peter J. Mountain, The Hague, Netherlands, assignor to British Telecommunications, London, England

Filed Aug. 19, 1983, Ser. No. 524,776

Claims priority, application United Kingdom, Aug. 26, 1982, 8224481

Int. Cl.³ H04Q *11/04*

U.S. Cl. 370—68 **12 Claims**



1. An aligner with a time switching capability for use in a digital transmission system, said aligner comprising:

storage means for storing n bytes of data in frames comprising m bytes where n>m,

the storage means being arranged such that data is written sequentially under the control of timing signals associated with incoming data, and

means for controlling the reading of data bytes from said storage means to generate outgoing frames of m bytes, including logic means which generates read addresses for the particular bytes to be read at any given read time as determined by other timing signals, said logic means being arranged to detect when a generated read address is in a predetermined relationship with the present write address and, in response to such detection, to instead cause reading of a data byte from the corresponding address of the just-previous or just-subsequent frame of m bytes.

4,535,447

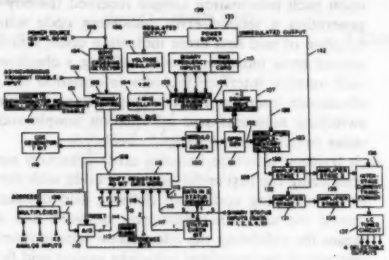
REMOTE MONITORING SYSTEM TRANSMITTER

Albert P. Rosanes, Centerport and Timothy P. Haley, Massapequa, both of N.Y., assignors to Hazeltine Corporation, Commack, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,301

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—77 **5 Claims**



1. An apparatus for transmitting information over the secondary network of a power distribution network including a power source, a primary source, a primary network, a transformer and a secondary network comprising:

(a) a multiplexer having multiple inputs and an output;

(b) first means for providing to the inputs of the multiplexer analog information corresponding to the information to be transmitted;

(c) second means having an input connected to the output of the multiplexer for converting analog information provided by the multiplexer output into digital information and supplying the digital information at an output;

(d) a shift register for storing the digital information having an input connected to the output of the second means and having an output supplying the digital information stored in the shift register;

(e) third means for modulating a carrier signal with the digital information stored in the shift register;

(f) fourth means for transmitting over the power distribution network the modulated carrier signal supplied by the third means; and

(g) timing means associated with the secondary network of a power distribution network and including a zero crossing detector for supplying a clock signal and for synchronizing said timing means to the power source, said timing means being responsive to the clock signal and controlling the multiplexer switching and the third means.

4,535,448

DUAL BUS COMMUNICATION SYSTEM

Leslie A. Baxter, Eatontown, and Sanford S. Brown, River Plaza, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 10, 1982, Ser. No. 448,771

Int. Cl.³ H04J *3/02*

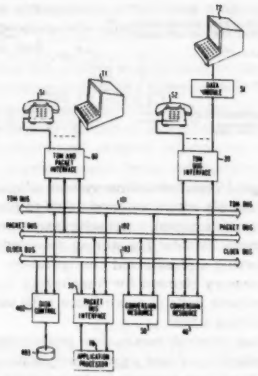
U.S. Cl. 370—85 **8 Claims**

1. In a communication system, a time division bus arranged to interconnect a plurality of communication circuit boards for intercommunication among said circuit boards in established time slots on said time division bus, said time division bus characterized in that data communicated on said bus is routed by the time slot relationship of said data on said time division,

a packet-switched bus arranged for intercommunication in bursty fashion among said plurality of communication circuit boards, said packet-switched bus characterized in that data communicated on said bus is routed in accordance with information contained within said data on said packet-switched bus,

means for connecting certain of said circuits directly to said time division bus, certain of said circuits directly to said

packet-switched bus, and certain of said circuits directly and concurrently to both of said busses, and wherein said communication circuits are contained within one or more circuit board housings, each circuit board housing having multiple positions therein for the placement of said communication circuit boards and wherein any of said communication circuit boards may be placed in any of said



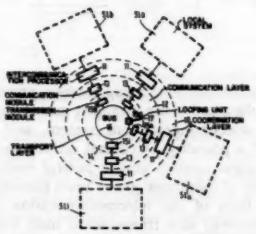
positions while still having said direct connection to either or both of said busses and wherein each of said busses includes a multipath cable having a termination for each said path at each said position of each said housing, and wherein said circuits which are connectable to both of said busses include means for receiving first data from one of said busses and for delivering second data to the other one of said busses in response to receipt of said first data.

4,535,449

TIME-LOCKING METHOD FOR STATIONS WHICH FORM PART OF A LOCAL LOOP NETWORK, AND LOCAL LOOP NETWORK FOR PERFORMING THIS TIME-LOCKING METHOD

Jean-Pierre Arragon, Roissy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,619
Claims priority, application France, Apr. 30, 1982, 82 07536
Int. Cl.³ H04J 3/00
U.S. Cl. 370—86 **12 Claims**



1. In a local loop network comprising a plurality of stations which are distributed along a bus, each station being connected to the bus by way of a coupler, said bus comprising a looping unit inserted in the bus, a method for the time-locking of the stations, said method including an initialization phase for allocating to each station a time reference with respect to a master clock of the looping unit, characterized in that the initialization phase forms part of a transmission phase which comprises the following steps:

(a) the transmission of a frame, referred to as the transmission frame, by the looping unit, said transmission frame comprising:

a synchronization word which initializes the transmission and initialization phase,

at least one slot which initially does not contain data and which has for each station a different position with respect to the position of the synchronization word, said position corresponding to the time position occupied by each station in the transmission frame;

(b) the generating of a transmission command by at least one station after the transmission of the synchronization word;

(d) the insertion, by the station and under the control of the transmission command, of a word into the empty slot allocated to the station;

said transmission phase being followed by a receiving phase which comprises the following steps:

(a) the demodulation of the transmission frame by the looping unit;

(b) the retransmission, in the form of a frame which is referred to as the receiving frame, of said demodulated transmission frame by the looping unit,

(c) the measurement by the station of the delay, with respect to the beginning of the slot allocated thereto, with which the word has been inserted into the allocated slot by the station during the transmission phase;

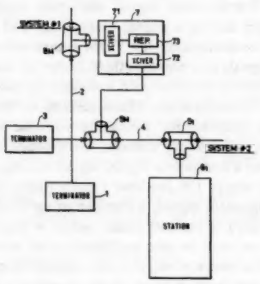
(d) the storage by the station of the measured delay value in order to enable the station to advance the insertion of the word into the allocated slot during a next transmission by a period which corresponds to the delay value.

4,535,450

DIGITAL SIGNAL REPEATING SYSTEM

Yoichi Tan, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,595
Claims priority, application Japan, Oct. 30, 1981, 56-172899
Int. Cl.³ H04J 3/00, 6/00, 3/02
U.S. Cl. 370—94 **10 Claims**



1. A digital signal repeating system, comprising: a plurality of digital signal transmission systems interconnected by repeating installations, each such system being a time division multiple access system of the type in which multiple stations access a communication cable by transmitting packets of information during available time slots of successive periodically repeated frames, each one of said stations selecting a time slot for transmission of its packets on a time slot available basis, wherein each of said repeating installations comprises: input/output means for effecting digital signal input or output operations between two signal transmission systems interconnected by said repeating installation, packet selecting means for selecting only packets to be sent from one of said two signal transmission systems to the other signal transmission system, buffer memory

means for writing thereinto transfer information of a packet which is to be sent to said other signal transmission system and which is selected by said packet selecting means, and transmission control means for reading out the transfer information so as to transmit it as a packet to said other signal transmission system, thereby enabling digital signal transmission in packet form between different signal transmission systems in one and the same communication system; said transmission control means comprising frame detection means responsive to the digital signal transmissions on said other signal transmission system for controlling the time of transmission of said packet to place said packet within said frame in a time slot not otherwise occupied by digital signal transmissions.

4,535,451

FOURTH-ORDER DIGITAL MULTIPLEX SYSTEM FOR TRANSMITTING A PLURALITY OF DIGITAL SIGNALS AT A NOMINAL BIT RATE OF 44 736 KBIT/S

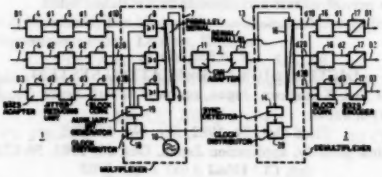
Jan Drupsteen, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1983, Ser. No. 465,741

Claims priority, application Netherlands, Aug. 5, 1982, 8203110

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—99 **3 Claims**



1. A fourth-order digital multiplex system comprising a transmitter having a digital multiplexer and a receiver having a digital demultiplexer for TDM transmission of a plurality of digital signals at a nominal third-order bit rate of 44,736 kbit/s over a common digital path between the said multiplexer and the said demultiplexer, characterized in that the said multiplexer is adapted for cyclically bit-wise interleaving three digital signals having nominal third-order bit rates of 44,736 kbit/s into a composite digital signal having a nominal fourth-order bit rate of 139,264 kbit/s and a frame comprising a 12 bit frame alignment signal, a number of service bits and, in addition, for each of the said three signals, a number N of information bits as well as one justification bit with five associated justification service bits, the said number N being such that the nominal justification ratio of the composite digital signal is in the range from 0.40 to 0.60 but exclusive of the range from 0.46 to 0.54, which frame is arranged in six consecutive sets having equal numbers of bit time slots, wherein

the bits of the frame alignment signal occupy the first 12 bit positions of the first set,

the justification service bits of the first, second and third of the said three signals occupy the first, second and third bit positions, respectively of, in succession, the second set to the sixth set,

the service bits occupy the bit positions following after the third bit position in the fourth set, and

the information bits of the said three signals cyclically occupy the remaining bit positions of the six sets; and the said demultiplexer is adapted for separating the said composite signal into the said three signals.

4,535,452

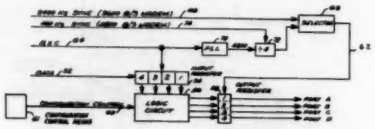
MULTI-MODEM VARIABLE PORT DEMULTIPLEXER SYNCHRONIZATION ADAPTER

Terrel W. Sandberg, Cedar City, Utah, and Stanley Bottoms, Seminole, Fla., assignors to Paradyne Corp., Largo, Fla.

Filed Feb. 29, 1984, Ser. No. 582,785

Int. Cl.³ H04J *3/06*

U.S. Cl. 370—100 **7 Claims**



1. In a digital communication system adapted to transmit multi-valued signals which are modulated to provide a demultiplex synchronizing signal, a demultiplexer comprising:

a first memory element for storing received data bits said signals having a preselected configuration;

a second memory element for transferring received data to several remote units in accordance with said demultiplex synchronizing signal;

configuration control means for generating a command signal indicative of said signal configuration; and

a logic array without memory for transferring from said first memory element to a second memory element in response to said command signal.

4,535,453

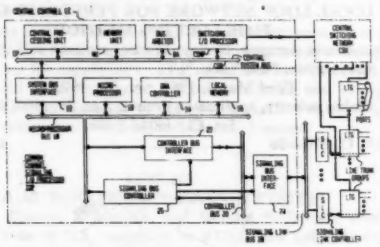
SIGNALING INPUT/OUTPUT PROCESSING MODULE FOR A TELECOMMUNICATION SYSTEM

Robert B. Rhodes, Plantation, and James R. Paolantonio, Coral Springs, both of Fla., assignors to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Dec. 27, 1982, Ser. No. 453,858

Int. Cl.³ H04J *3/12;* H04Q *11/04*

U.S. Cl. 370—110.1 **21 Claims**



1. An input/output processing module providing common channel signaling and being arranged in a central control unit of a digital telecommunications system, said system being composed of a plurality of central offices each including a respective central control unit, a central switching network and a plurality of line trunk group units forming interfaces of transmission lines of the telecommunication system to the switching network, said transmission lines including trunks dedicated to transferring signaling information and being associated at each end with respective signaling link controllers, wherein the central control unit has a main processing system including a central system bus, and said input/output processing module, forming an independent module residing on this central system bus, is dedicated to processing of signaling control information to be exchanged between the central processing system and said signaling link controllers, said input-/output processing module comprising:

a microprocessor system provided for initiating, starting and controlled resetting of signaling information transfer operations under supervision of the central processing system by means of respective input/output control commands and having a system bus interface unit connected to the central system bus, a microprocessor unit, a local memory unit and a microprocessor bus interconnecting said units of the microprocessor system;

a further bus arrangement constituting a signaling link bus and being commonly connected to said signaling link controllers; and

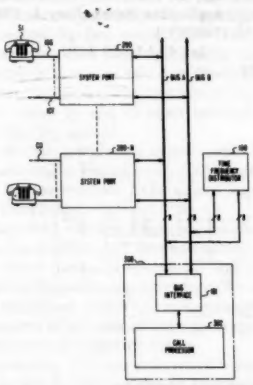
a signaling link bus control arrangement connected to both the microprocessor bus and the signaling link bus and including programmable control means for sequentially executing transfer operations of signaling information and related input/output control information, and further including interface means being independently accessible by both the microprocessor system and the control means of the signaling link bus control arrangement for enabling bi-directional data transfers between the microprocessor system and said control means.

4,535,454

MULTIFREQUENCY TONE DISTRIBUTION USING A CONFERENCING ARRANGEMENT

Clair A. Buzzard, Lincroft, and Kent V. Mina, Colts Neck, both of N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Sep. 15, 1983, Ser. No. 532,313
Int. Cl.³ H04J *3/12, 3/16*
U.S. Cl. 370—110.2 **14 Claims**



10. A multifrequency tone distribution arrangement adapted for use in a communication system in which a call processor is in communication with at least one port circuit via a common time division multiplexed bus of n-time slots occurring within each of a plurality of system frames of time slots, comprising

means for generating a plurality of single frequency signals, each of said single frequency signals being a component of a predetermined plurality of multifrequency tones, each of said tones being associated with a respective digit,

means for supplying each of said single frequency signals to said bus during respective ones of said time slots, and

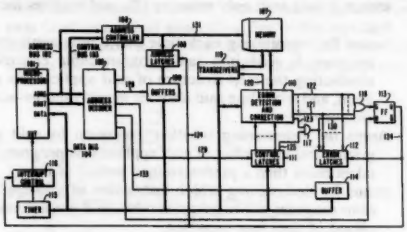
port circuit means responsive to a signal indicative of said respective digit for forming the associated multifrequency tone by removing from said bus, during its respective one of said time slots, each component of said associated multifrequency tone and conferencing each said removed component together.

4,535,455

CORRECTION AND MONITORING OF TRANSIENT ERRORS IN A MEMORY SYSTEM

Donald W. Peterson, Yorkville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 11, 1983, Ser. No. 474,447
Int. Cl.³ G06F *11/10*; G11C *29/00*
U.S. Cl. 371—13 **20 Claims**



1. An arrangement for correcting and monitoring errors occurring in memory means having a plurality of memory locations, comprising

means for detecting an occurrence of one of said errors in an accessed memory location of said memory;

generating means responsive to the occurrence of one of said errors for generating an error signal;

processor means responsive to said error signal and a first set of program instructions to generate a set of signals for reaccessing said accessed memory location;

means for correcting the reaccessed contents of said accessed memory location;

said processor means being further responsive to a second set of program instructions and the corrected reaccessed contents for rewriting the latter into said accessed memory location; and

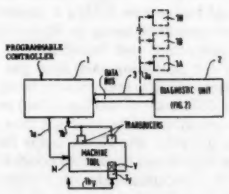
said processor means being further responsive to said reaccessed corrected contents and a third set of program instructions for updating an error rate table stored in said memory means.

4,535,456

METHOD OF DETECTING EXECUTION ERRORS IN PROGRAM-CONTROLLED APPARATUS

Kurt Bauer, Ostfildern-Nellingen; Karl-Heinz Fischer, Markgröningen, and Heinz Huber, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 16, 1983, Ser. No. 466,875
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206891
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—16 **8 Claims**



8. The combination of a programmable controller (1), a diagnostic unit (2), a data bus (3) interconnecting said controller and diagnostic unit, a device (M) controlled by the programmable controller, and transducers (T) and input lines (1b)

connected to, and signaling operating conditions of, the device (M) to the programmable controller (1)

wherein, in accordance with the invention,

the programmable controller includes a memory storing a particular application program therein;

the diagnostic unit (2) includes a microprocessor (8), a random-access memory (4), a read-only memory (5), and an interconnecting data bus (9); and diagnostic routines are stored in said read-only memory (5), said routines including:

means for recognizing each time that a new applications program is read into said programmable controller, abstracting the step structure of said applications program, and recording said abstract in said random-access memory (5);

means for determining whether execution by said programmable controller of said applications program has taken more than a predetermined period of time;

means for determining which instruction of said applications program was in progress when said predetermined period of time was exceeded;

means for determining from which of said transducers signals were necessary for execution of said instruction in progress, and which of said necessary signals were missing;

and means for generating a code identifying which input line failed to provide said missing signal.

4,535,457

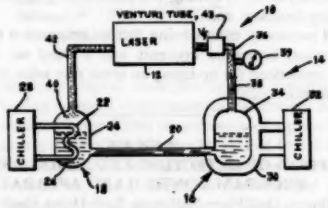
TRANSVERSE FLOW CW ATOMIC IODINE LASER SYSTEM

LaVerne A. Schlie, and Robert D. Rathge, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1984, Ser. No. 593,759

Int. Cl.³ H01S 3/22

U.S. Cl. 372—58 **10 Claims**



1. A transverse flow CW atomic iodine laser system, said system comprising:

means for providing ultraviolet radiation to a lasing gas medium to produce excited atomic iodine,

a closed cycle fuel system, said fuel system providing a continuous flow of a laser gas to form said lasing gas medium when said ultraviolet radiation interacts with said laser gas, said fuel system having a condenser for liquifying said laser gas after lasing to form a liquid fuel, said condenser outputting said liquid fuel to an evaporator, said evaporator providing said laser gas for lasing at a predetermined velocity, said velocity being regulated by a temperature difference of said liquid fuel in said condenser and said evaporator and by laser gas flow orifices in said fuel system, whereby said closed cycle fuel system operates without loss of said liquid fuel condenser, said evaporator and said condenser connected together such that a liquid fuel is transferred to said evaporator, said evaporator providing said laser gas at a predetermined velocity,

a transverse laser flow section, said flow section attached to said means for providing ultraviolet radiation and to said closed cycle fuel system, said flow section comprising: a housing, a transverse flow cavity, and said laser cell, said housing having a void therein, said housing having a coolant input port and output port for allowing said coolant to circulate about said transverse flow cavity and about said laser cell positioned within said void, said housing having a laser gas input port and output port for allowing said laser gas to flow into and out of said transverse flow cavity, and said housing having laser beam output ports, said transverse flow cavity having an upstream and a downstream flow cavity, said flow cavities being surrounded by walls to confine the flow of laser gas therein, said upstream flow cavity having therein a flow diffuser and a flow straightener, said downstream flow cavity having therein a flow straightner, said laser cell being attached between said upstream and said downstream flow cavities, and said laser cell having a window for allowing said ultraviolet radiation to enter said cell to pump said laser gas, a radiation reflector for reflecting ultraviolet radiation back onto a transverse laser axis within said laser cell, and a void therein for said lasing gas medium, and

a laser resonator connected to said laser cell to receive and output laser radiation.

4,535,458

LASER APPARATUS

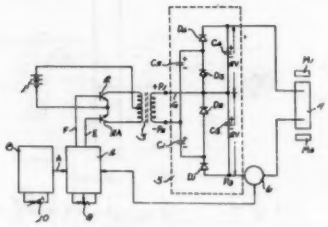
Hitosi Inoue, Kanagawa; Norihiro Suenaga, Tokyo, and Nobuyuki Suenaga, Kanagawa, all of Japan, assignors to Nippon Infrared Industries Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,246

Claims priority, application Japan, May 1, 1981, 56-65241; Nov. 21, 1981, 56-174008[U]

Int. Cl.³ H01S 3/10

U.S. Cl. 372—25 **7 Claims**



1. A laser apparatus comprising:

a pulse power source which intermittently produces a pulse train consisting of a plurality of successive high frequency pulses;

an m times voltage multiplier circuit which boosts the voltage value of the high frequency pulses produced from said pulse power source m times as many as the value and rectifies the high frequency pulses; and

a laser discharge tube directly connected to the DC output terminal of said m times voltage multiplier circuit,

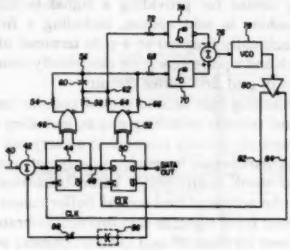
the number m of the voltage multiplying steps of said voltage multiplier circuit being at least 3 and the voltage value of said high frequency pulses not exceeding about ½ of the working voltage of said laser discharge tube,

said pulse power source including means for adjusting the pulse width of an output laser beam by varying the number of the high frequency pulses included in said train of successive high frequency pulses.

4,535,459
SIGNAL DETECTION APPARATUS

Charles R. Hogge, Jr., Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 26, 1983, Ser. No. 498,385
Int. Cl.[3] H03K 1/17, 5/156
U.S. Cl. 375—80 10 Claims



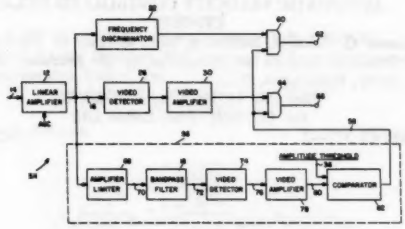
1. Phase detector means comprising, in combination:
data signal input means for supplying input data;
first D flip-flop means, including D and C (clock) input terminal means and Q output terminal means;
second D flip-flop means, including D and C (clock) input terminal means and Q output terminal means;
first EOR (exclusive OR) means, including input means and output means, connected to receive input signals at said input means thereof from the D and Q terminal means of said first flip-flop means
second EOR (exclusive OR) means, including input means and output means, connected to receive input signals at said input means thereof from the D and Q terminal means of said second flip-flop means
means connecting said data signal input means to said D input terminal means of said first flip-flop means;
means connecting said Q output terminal means of said first flip-flop means to said D input terminal means of said second flip-flop means;
first and second integrating means, each including input means and output means, connected to said output means of said first and second EOR means for receiving input signals therefrom;
VCO (controlled variable frequency oscillator) means, including input means and first and second opposite phase signal output means, connected to said output means of said first and second integrator means for receiving output signals therefrom, said VCO means varying in frequency as a function of the sum of the signals received from said first and second integrator means;
means connecting said first and second output means of said VCO to said C input means of said first and second D flip-flop means respectively; and
means for outputting retimed data from the Q output terminal means of said second flip-flop means.

4,535,460
METHOD AND APPARATUS TO FILTER PULSED RF SIGNALS

John O. Wedel, Jr., 4218 Southfield Rd., Ellicott City, Md. 21043

Filed Feb. 1, 1984, Ser. No. 576,093
Int. Cl.[3] H04B 1/10
U.S. Cl. 375—104 14 Claims

1. A receiver, comprising:
input means for filtering pulsed RF signals and passing any pulsed RF signals which are within a first selected frequency band;
signal limiting means for converting said filtered pulsed RF signals into hard-limited pulsed RF signals having either a first or second instantaneous value;
bandpass filter means for filtering said hard-limited pulsed RF signals and passing any hard-limited pulsed RF signals within a second selected frequency band which is narrower than, and included within, said first frequency band;
first detector means for detecting the envelope of said filtered hard-limited pulsed RF signals passed by said bandpass filter means and generating first video signals;
signal comparator means for comparing said first video signals with a selected threshold value and generating a

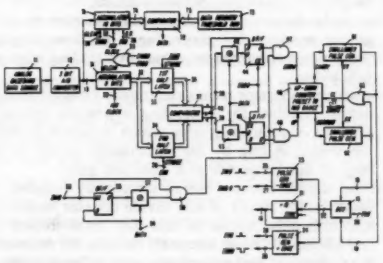


gate signal whenever said first video signals exceeds said threshold value;
first switching means, which is controlled by said gate signal and which is closed or rendered conductive upon receipt of said gate signal;
second detector means, connected in series with said first switching means between said input means and a first output of the receiver, for detecting the envelope of said filtered pulsed RF signals passed by said input means and providing second video signals at the receiver first output whenever said first video signals exceed said threshold value.

4,535,461
DIGITAL CLOCK BIT SYNCHRONIZER

Elvin D. Stepp, Fairfield, and Gary L. Claypoole, West Chester, both of Ohio, assignors to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Jun. 1, 1983, Ser. No. 500,088
Int. Cl.[3] H04L 7/02
U.S. Cl. 375—110 19 Claims



19. Apparatus for synchronizing a clock wave normally having a reference frequency to the frequency of serial binary data bits comprising digital circuit means responsive to the data bits for deriving the clock wave by selectively (a) incrementing the reference frequency, (b) decrementing the reference frequency and (c) not changing the reference frequency, the digital circuit means including: means responsive to the derived clock wave for dividing each data bit into nN sub bits so that each data bit is divided into n groups of N sub bits,

means for comparing the binary values associated with the n groups of N sub bits with each other, and control means responsive to the derived clock wave and the comparing means for: (a) not changing the reference frequency when the binary values associated with the N bits of each of the n sub groups are the same, (b) incrementing the reference frequency when the binary values associated with the N bits of each of the n sub groups have a first relation different from being the same, and (c) decrementing the reference frequency when the binary values associated with the N bits of each of the n sub groups have a second relation different from being the same.

4,535,462

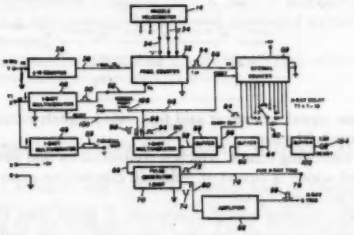
AUTOMATIC VELOCITY CONTROLLED DELAY CIRCUIT

Jimmy Q. Schmidt, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 11, 1983, Ser. No. 465,733

Int. Cl.³ G01P *3/64*; G06M *3/02*

U.S. Cl. 377—2 **3 Claims**



1. In a system having a machine for X-raying a projectile in selected muzzle blast regions of a gun, an automatic velocity controlled delay circuit for triggering the X-raying, said circuit comprising: muzzle velocimeter means for generating a time interval, first pulse at a "Z" output terminal thereon, which analogously represents the sensed presence by the velocimeter means of the projectile in a selected blast region of the gun, and for generating clocking, second pulses at a "Y" output terminal thereon, and for generating digital decade, third signals equal in time duration, in microseconds to said time interval, first pulse duration;

divide counter means electrically coupled to said "Y" output terminal for generating a clocking, fourth pulse which is proportional to the number of said second clocking pulses received from said velocimeter means;

first multivibrator means electrically coupled to said "Z" output terminal for generating a positive output, fifth pulse when triggered by a negative trailing edge of said first pulse;

second multivibrator means electrically coupled to said "Z" output terminal for generating a positive output, sixth pulse having a leading edge which coincides in time with the sensed exiting by the velocimeter means of a front edge of said projectile as it exits said gun;

second digital counter means electrically coupled to the fourth pulse output of said divide counter means, and to said fifth pulse output of said first multivibrator means, and having "J" input terminals thereon for receiving said third signals of said velocimeter means, for switching from a master preset mode to a count mode upon receipt of said fifth pulse from said first multivibrator, and for counting the number of fourth pulses of said divide counter means until their duration is the same as the time in microseconds of said third signals, the number entered in said "J" input terminals; and decimal counter switching means including a decimal counter and a settable rotary switch means for generating a consecutive output, seventh pulse train wherein the seventh pulses are separated from each other an amount the same as the time duration of said third signals entering said second digital counter means, for providing an X-ray triggering output at discrete, eighth, time delays equal to the said third time interval pulse duration plus "n" times the said third time interval pulse duration, said rotary switch having a plurality of settable outputs for selection of eighth time delays as increments n of said third pulse duration;

means for amplifying the said X-ray triggering output of said switching means for providing a signal to trigger the X-ray machine in said system, including a first buffer circuit electrically coupled to a pole terminal of said rotary switch and a pulse generator electrically connected to the output of said first buffer circuit;

means for resetting said second digital counter means and said decimal counter switching means, including a second buffer circuit electrically coupled to a carry out terminal of said decimal counter to receive a carry out signal therefrom, and third multivibrator means electrically connected to the output of said second buffer means for providing a reset input signal to said first multivibrator means and to a reset terminal of said decimal counter switching means; and

indicator means electrically connected to said decimal counter switching means for determining if it is properly reset after initial power is applied.

4,535,463

APPARATUS FOR DETECTING NUMBER OF REMAINING SHEETS

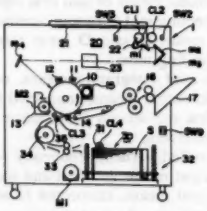
Masazumi Ito, Toyokawa, and Kenzo Nagata, Okazaki, both of Japan, assignors to Minolta Camera Co., Ltd., Osaka, Japan

Filed Sep. 24, 1982, Ser. No. 423,078

Claims priority, application Japan, Oct. 13, 1981, 56-163825; Oct. 13, 1981, 56-163826

Int. Cl.³ G06M *7/06*

U.S. Cl. 377—8 **15 Claims**



1. In a paper feeder having a mechanism for holding a stack of sheets on a tray and lifting the stack to a predetermined upper limit position every time the height of the stack decreases by a specified amount due to removal of sheets from the tray, an apparatus for detecting the number of remaining sheets comprising:

means for generating corresponding signals relative to the lifting movement of the stack;

means for counting the number of sheets removed from the tray which corresponds to a predetermined lifting movement of the stack;

means for detecting the signals generated with a lifting movement of the stack to obtain numerical data corresponding to the amount of the lift;

means for obtaining numerical data corresponding to the height of the remaining stack; and

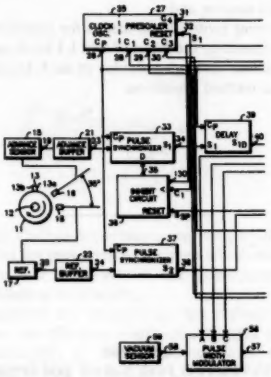
means for calculating the number of remaining sheets from the data corresponding to the amount of the lift, the number of sheets used and the data corresponding to the height of the remaining stack and producing a representative signal.

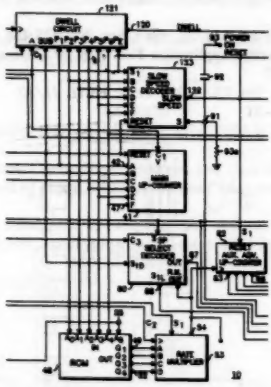
4,535,464

DIGITAL CIRCUITRY FOR PRODUCING INDICATIVE SIGNALS AT PREDETERMINED TIMES PRIOR TO PERIODIC PULSES

Adelore F. Petrie, Arlington Hgts., Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 49,014, Jun. 15, 1979,. This application Nov. 2, 1981, Ser. No. 317,710
Int. Cl.³ G06M 3/02
U.S. Cl. 377—39 7 Claims





1. Improved digital circuitry for receiving a signal comprising periodic pulse transitions and producing indicative signals commencing at predetermined times prior to the occurrence of the periodic pulse transitions, said circuitry comprising:

means for producing a periodic signal comprising periodic signal pulse transitions occurring at a predetermined variable rate;

means for receiving said periodic signal and for periodically developing a running count by counting pulses occurring at a predetermined rate, independent of said variable rate, between first and second predetermined time occurrences directly corresponding to the occurrence of sequential first and second pulse transitions of said periodic signal, and for providing at said second time occurrences maximum running counts related to the time duration between said first and second pulse transitions;

means for periodically receiving said maximum counts and effectively subtracting a predetermined number of counts therefrom to obtain a resultant subtracted count, said subtraction being completed at substantially said second time occurrences; wherein the improvement comprises,

means counting down from said resultant subtracted count at a rate which is independent of said variable rate; and

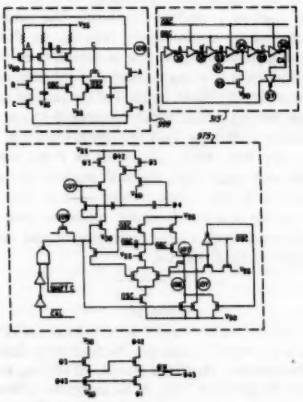
means for periodically initiating an indicative signal when the down count from said resultant subtracted count equals a predetermined threshold count subsequent to said second time occurrence and at a predetermined time prior to the next of said periodic signal pulse transitions.

4,535,465

LOW POWER CLOCK GENERATOR CIRCUIT

Jerald G. Leach, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 24, 1981, Ser. No. 334,486
Int. Cl.³ H03K 23/22
U.S. Cl. 377—46 2 Claims



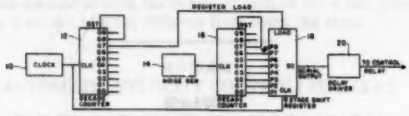
1. A digital counter for counting the number of times an input signal alternates between a first logic state and a second logic state comprising:

a plurality of inverter means for inverting of signals, having at least a first inverter means and a last inverter means, each inverter means includes an input means for receiving of the input signal; a node; first output and a second output for the last inverter means; a first circuit means for periodically precharging the node; a second circuit means for discharging the node when the input signal is at the first logic state and the first circuit means is not precharging the node; a third circuit means for isolating the node from the first and second output line when the first circuit means is precharging the node; the plurality of inverter means further being connected in cascade arrangement from the first inverter means to the last inverter means and with the first output being connected to the input of the next member of the cascade arrangement and the second output of the last inverter means being connected to the input of the first inverter means, the input of the first inverter means additionally being the input terminal for receiving of the input signal and the first output of the last inverter means being the output terminal for providing a counted output signal; reference potential; and switch means for selectively connecting a first output of a predetermined inverter means to the reference potential in response to the input signal connected thereto.

4,535,466
RANDOM TIMER

Frank A. Palvolgyi, Granville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 10, 1983, Ser. No. 521,803
Int. Cl.³ H03K *21/14*
U.S. Cl. 377—54 1 Claim

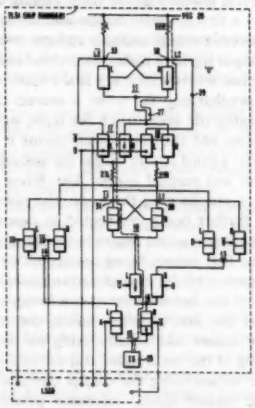


1. A timer system comprising: a clock providing pulses at a given frequency on a clock output lead, a first counter having a clock input connected to the clock output lead, the first counter having N stages continuously recycling, a digital noise generator, a second counter having a clock input connected to an output of the digital noise generator so that its outputs are sequentially high at a random frequency, the second counter being connected to continuously recycle, an N-stage shift register having parallel inputs one of which is connected to a fixed potential for a low logic level, the other parallel inputs being connected to different outputs of the second counter, the shift register having a load input connected to one output of the first counter so that the shift register is loaded at its parallel inputs on every Nth clock pulse with an N-bit word having one and only one stage high, the shift register having a clock input connected to the clock output lead so that the word appears bit by bit at a serial output, whereby time is divided into equal intervals with a pulse appearing at said serial output at random within each interval.

4,535,467
SWITCH LOGIC FOR SHIFT REGISTER LATCH PAIR

James W. Davis; Joel C. Leininger, both of Boca Raton; Carlos Munoz-Bustamante, Highland Beach, all of Fla., and Gordon J. Robbins, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1982, Ser. No. 445,601
Int. Cl.³ G11C *19/00*
U.S. Cl. 377—81 14 Claims



1. A Level Sensitive Scan Design (LSSD) Shift Register Latch (SRL) pair comprising in combination:

an L1 bistable latch having an input, cross-coupled conductive devices and output nodes;

an L2 bistable latch having an input, cross-coupled conductive devices and output nodes;

a first clock signal;

first current switch logic means responsive to said first clock signal to interconnect the output nodes of said L1 latch alternately to the input and the output nodes of said L2 latch for selectively transferring data in said L1 latch to said L2 latch;

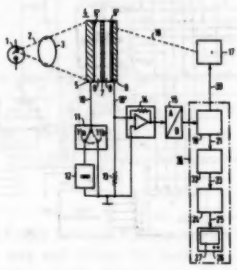
one current source; and

second current switch logic means for connecting said one current source to the input of said L1 latch, so as to establish a current through a device of each latch to maintain each in a latched condition.

4,535,468
IMAGE CONVERTED FOR X-RAY EQUIPMENT AND THE LIKE

Karl Kempter, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 23, 1983, Ser. No. 535,458
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236137
Int. Cl.³ G01T *1/24;* H01L *31/10*
U.S. Cl. 378—31 21 Claims



1. In X-ray exposure apparatus having two transparent electrodes extending over an area and connected to a d-c voltage which is on the order of 3000 volts, and first and second solid substance layers, located between the electrodes and in direct contact with the electrodes, whose free surfaces abut a charge storage layer, wherein the first solid substance layer is a photoconductive layer which is 100 to 500 microns thick and receives the image beams, and the second solid substance layer is a photoconductive layer which receives an optical ray imaged in a scanning raster, the improvement comprising:

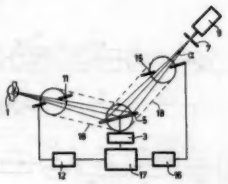
(a) said storage layer comprising arsenic and sulphur, having traps for charge carriers, and being 0.01 to 10.0 microns thick, and

(b) said electrode connected to said first solid substance layer has the same polarity as the charge carriers which are trapped by the storage layer.

4,535,469
X-RAY ANALYSIS APPARATUS HAVING AN ADJUSTABLE STRAY RADIATION SLIT

Cornelis G. Brandt, Almelo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,279
Claims priority, application Netherlands, Mar. 31, 1982, 8201343
Int. Cl.³ G01N *23/20*
U.S. Cl. 378—081 10 Claims

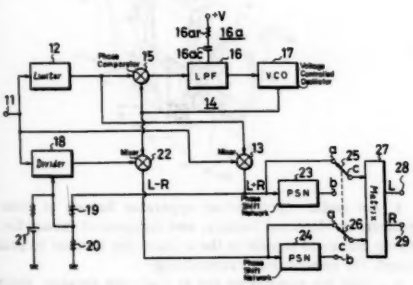


1. An X-ray analysis apparatus comprising an X-ray source,
a goniometer for mounting a specimen which receives radiation from said X-ray source, said goniometer having an angle adjusting mechanism,
a stray radiation slit controlling said radiation from said specimen, the effective width of said stray radiation slit being adjustable in correspondence with said angular adjustment of said goniometer,
a detector slit receiving said radiation from said stray radiation slit, and
an X-ray detector receiving said radiation from said detector slit,
wherein signal-to-noise ratios of analysis measurements are significantly improved.

4,535,470
AM STEREO DECODER FOR MULTIPLE CODING SYSTEMS

Satoshi Yokoya, Chofu; Norio Numata, and Ikuo Shimizu, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 6, 1983, Ser. No. 492,269
Claims priority, application Japan, May 27, 1982, 57-90364
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—15 25 Claims

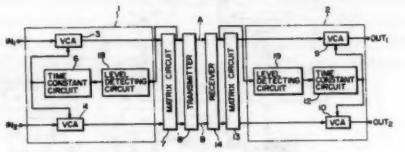


1. Apparatus for decoding left channel signals and right channel signals from AM stereo signals coded according to any of several known methods, comprising:
envelope detecting means responsive to said AM stereo signals for producing stereo sum signals formed of the sum of the left channel signals and the right channel signals;
synchronous detecting means responsive to said AM stereo signals for producing stereo difference signals formed of the difference between the left channel signals and the right channel signals;
selective phase shift means connected to receive said stereo sum signals and said stereo difference signals for selectively producing either a first output signal pair formed of said stereo sum signals and said stereo difference signals or a second output signal pair formed of said stereo sum signals and said stereo difference signals each shifted in phase by a predetermined amount; and
matrix means connected to said selective phase shift means to receive either said first output signal pair or said second output signal pair for producing left channel signals and right channel signals therefrom.

4,535,471
COMPRESSION/EXPANSION DEVICE

Kazuo Kuroda, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 26, 1983, Ser. No. 526,843
Claims priority, application Japan, Aug. 27, 1982, 57-129585[U]
Int. Cl.³ H03G *7/00;* H04H *5/00*
U.S. Cl. 381—2 9 Claims

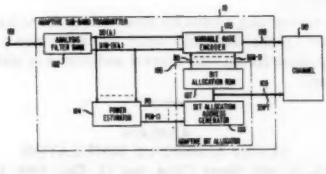


1. A compression/expansion device of the type for processing first and second audio signals and having means for generating an additive signal corresponding to the sum of said first and second audio signals and a subtractive signal corresponding to the difference between said first and second audio signals, said device comprising:
compression means for compressing at least one of said first signal, said second signal, said additive signal and said subtractive signal in accordance with the level of said additive signal; and
expansion means for expanding said at least one signal in accordance with the level of said additive signal.

4,535,472
ADAPTIVE BIT ALLOCATOR

James D. Tomcik, Aberdeen, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 5, 1982, Ser. No. 439,345
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—31 20 Claims



1. Apparatus for allocating bits from a predetermined total number of bits to individual ones of a plurality of signals comprising:
means for generating a representation of a prescribed characteristic of each of the plurality of signals;
means for storing a plurality of predetermined bit allocation patterns and being responsive to an address signal for

outputting one of said predetermined bit allocation patterns identified by said address; and

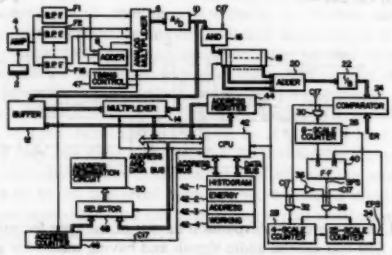
means for storing a plurality of templates each including predetermined representations of said prescribed characteristic of said plurality of signals, said templates corresponding on a one-to-one basis to said plurality of bit allocation patterns, and being responsive to said generated representations of said plurality of signals for generating said address by matching, in accordance with a first prescribed criterion, said generated representations to said representations of one of said stored templates.

4,535,473

APPARATUS FOR DETECTING THE DURATION OF VOICE

Tomio Sakata, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 27, 1982, Ser. No. 412,234
Claims priority, application Japan, Oct. 31, 1981, 56-175431
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—46 **5 Claims**



1. An apparatus for detecting the duration of voice comprising:

sampling means for sampling an input voice signal and generating a time-sequence of voice parameters;

memory means, connected to said sampling means, for storing the time-sequence of voice parameters;

first determining means for determining an interval by examining the time-sequence of voice parameters, said interval being divided into three periods, an estimated voice period, a first non-voice period preceding said voice period and a second non-voice period succeeding said voice period;

means for forming a histogram based on the voice parameters generated during said interval and divide the voice parameters into non-voice class and voice class based on the histogram;

second determining means for determining a threshold value based on the average of voice parameters in the non-voice class; and

third determining means for determining the voice duration based on the threshold value and the voice parameters generated during said interval and stored in said memory means.

4,535,474

AUDIO AMBIENCE SIMULATOR

Jeffrey G. Borish, Santa Clara, and M. Dale Ewy, Cupertino, both of Calif., assignors to Signal Research Laboratory, San Rafael, Calif.

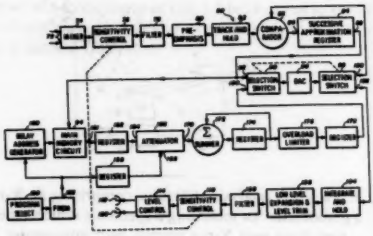
Filed Aug. 15, 1983, Ser. No. 522,993
Int. Cl.³ H03G *3/00*
U.S. Cl. 381—61 **14 Claims**

1. An ambience simulator comprising in combination:

an input connection means for receiving into the ambience simulator an electrical signal wherein said electrical signal corresponds to an audio signal;

a storage means for storing a representation of said electrical signal provided by the input connection means;

a recovery means for recovering said representation of said electrical signal from the storage means as a plurality of more than twelve delayed signals, with each of said delayed signals being a substantial reproduction of said representation of said electrical signal at a delay, which delay is distinct from the delay of each other of said delayed signals;



an attenuating means connected to receive said delayed signals and for attenuating each of said delayed signals at a preselectable amount of attenuation, with said attenuation being separately selectable for each of said delayed signals;

a combining means connected to receive and combine said delayed signals after each said delayed signal has been attenuated, thereby forming a composite signal;

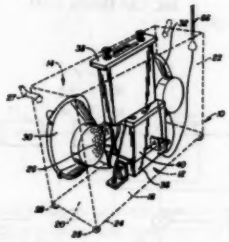
whereby said composite signal represents an ambience signal representative of an ambience which could be generated by an actual auditorium.

4,535,475

AUDIO REPRODUCTION APPARATUS

Cornelius S. Ward, 2038 85th Ave., Oakland, Calif. 94621

Filed Sep. 23, 1982, Ser. No. 427,000
Int. Cl.³ G11B *5/02*
U.S. Cl. 381—88 **6 Claims**



1. An audio reproduction apparatus having at least one speaker, an electrical battery, and component means for supplying electrical signals to the at least one speaker to produce sound, the improvement comprising:

a. a case for supporting the at least one speaker, electrical battery, and component means for supplying electrical signals; and

b. means for holding said electrical battery in relation to said component means for supplying electrical signals within said case, said means including bracket means for contacting said component means for supplying electrical signals, said bracket means being connected to said case, and a member connected to said bracket means and said electrical battery, said member further including means for

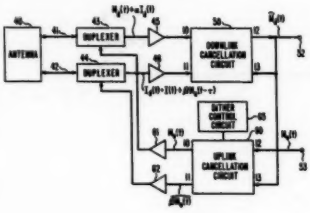
urging said battery and said component means for supply electrical signals into mechanical compression.

4,535,476

OFFSET GEOMETRY, INTERFERENCE CANCELING RECEIVER

James W. Carlin, Holmdel, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 1, 1982, Ser. No. 446,022
Int. Cl.³ H04B *1/12, 15/00*
U.S. Cl. 455—63 **8 Claims**



1. A signal communications arrangement including antenna means for receiving signals from a desired signal source and from an interference signal source located adjacent to the desired signal source, said antenna means comprising a main feedhorn which is focused on said desired signal source and an auxiliary feedhorn which is focused on said interference signal source, the antenna means being responsive to signals from the desired signal source for generating a composite signal including a desired message signal and a first interference signal, the antenna means also being responsive to signals from the interference signal source for generating a second interference signal comprising the first interference signal,

combining means including a first feedback control circuit responsive to a representation of the desired message signal for generating appropriate control signals to cause variations of the phase and amplitude of the first interference signal, means responsive to the control signals for adjusting the phase and amplitude of the first interference signal, and a combiner for combining the adjusted first interference signal with the composite signal to generate said representation of the desired message signal, and

signal translation means including a first duplexer coupled to the antenna means for interfacing the composite signal received therefrom, a first amplifier means for adjusting the amplitude of the composite signal to a predetermined level, a second duplexer coupled to the antenna means for interfacing the second interference signal received therefrom, and a second amplifier means for adjusting the amplitude of the second interference signal to a predetermined level.

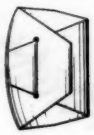
DESIGN PATENTS

GRANTED AUG. 13, 1985

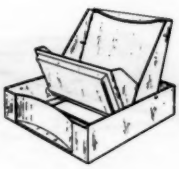
ERRATA

For CLASS	See PATENT NO.
D02–361	280,053

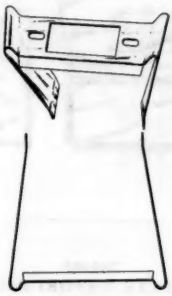
280,040
KNEE PROTECTOR
Albert E. Ostermaier, 4710 Sunnyslope Ave., Sherman Oaks, Calif. 91403
Filed Jun. 6, 1983, Ser. No. 501,146
Term of patent 14 years
U.S. Cl. D2—27



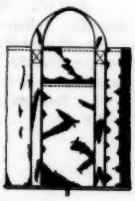
280,041
DISKETTE STORAGE CONTAINER
Jerry M. Long, Scotts Valley, and James A. Womack, Los Gatos, both of Calif., assignors to Innovative Concepts, Inc., San Jose, Calif.
Filed Jan. 24, 1983, Ser. No. 444,982
Term of patent 14 years
U.S. Cl. D3—35



280,042
HOLDER FOR A RADIO FOR MOUNTING OVER THE TRANSMISSION HUMP OF A VEHICLE
Eduard A. Jaeger, c/o R. L. Mikesell, Esq., 16311 Ventura Blvd., Suite 580, Encino, Calif. 91436
Filed Jan. 28, 1983, Ser. No. 433,544
Term of patent 14 years
U.S. Cl. D3—40

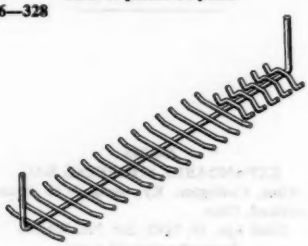


280,043
EXPANDABLE SHOPPING BAG
James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio
Filed Apr. 18, 1983, Ser. No. 486,051
Term of patent 14 years
U.S. Cl. D3—42



280,044
EXPANDABLE HAND AND SHOULDER BAG
James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio
Filed Apr. 18, 1983, Ser. No. 486,049
Term of patent 14 years
U.S. Cl. D3—48

280,045
ARTICLE SUPPORT RACK
Charles E. Benedict, Tallahassee, Fla., assignor to Telescoping Tie Racks, Inc., Winter Haven, Fla.
Division of Ser. No. 453,053, Dec. 27, 1982, Pat. No. D. 277,436.
This application Sep. 12, 1984, Ser. No. 649,771
Term of patent 14 years
U.S. Cl. D6—328



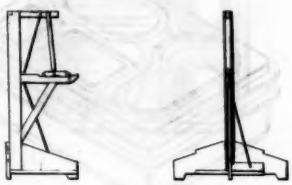
280,046
ARTICLE SUPPORT RACK
Charles E. Benedict, Tallahassee, Fla., assignor to Telescoping Tie Racks, Inc., Winter Haven, Fla.
Division of Ser. No. 453,052, Dec. 27, 1982, Pat. No. D. 277,248.
This application Oct. 12, 1984, Ser. No. 660,163
Term of patent 14 years
U.S. Cl. D6—328

280,047
ARTICLE SUPPORT RACK
Charles E. Benedict, Tallahassee, Fla., assignor to Telescoping Tie Racks, Inc., Winter Haven, Fla.
Division of Ser. No. 453,053, Dec. 27, 1982, Pat. No. D. 277,436.
This application Oct. 12, 1984, Ser. No. 660,165
Term of patent 14 years
U.S. Cl. D6—328

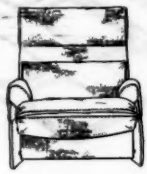
280,048
ARTICLE SUPPORT RACK
Charles E. Benedict, Tallahassee, Fla., assignor to Telescoping Tie Racks, Inc., Winter Haven, Fla.
Division of Ser. No. 453,053, Dec. 27, 1982, Pat. No. D. 277,436.
This application Oct. 12, 1984, Ser. No. 660,166
Term of patent 14 years
U.S. Cl. D6—328

280,049
ARTICLE SUPPORT RACK
Charles E. Benedict, Tallahassee, Fla., assignor to Telescoping Tie Racks, Inc., Winter Haven, Fla.
Division of Ser. No. 453,052, Dec. 27, 1982, Pat. No. D. 277,248.
This application Oct. 12, 1984, Ser. No. 661,473
Term of patent 14 years
U.S. Cl. D6—328

280,050
ACCESSORY STAND FOR USE IN SHINING BOOTS AND SHOES
John A. Kempf, Rte. 3, Fayette, Mo. 65248
Filed Apr. 4, 1983, Ser. No. 482,032
Term of patent 14 years
U.S. Cl. D6—329



280,051
PARLOR CHAIR
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti Industria Arredamenti di Saporiti Sergio e Giorgio S.N.C., Varese, Italy
Filed Sep. 28, 1982, Ser. No. 426,020
Term of patent 14 years
U.S. Cl. D6—334

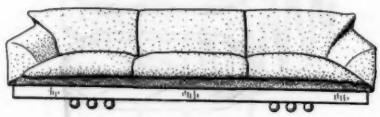


280,052
FOOT SUPPORT PANEL
Matti Hypponen, Iittala, Finland, assignor to Treston OY, Turku, Finland
Filed Apr. 18, 1983, Ser. No. 485,601
Claims priority, application Finland, Jan. 7, 1983, 17/83
Term of patent 14 years
U.S. Cl. D6—349

280,053
VIDEO GAME GLOVE
Michael S. Singer, 10751 NW. 21st Ct., Sunrise, Fla. 33322
Filed Jul. 5, 1983, Ser. No. 510,601
Term of patent 14 years
U.S. Cl. D2—361

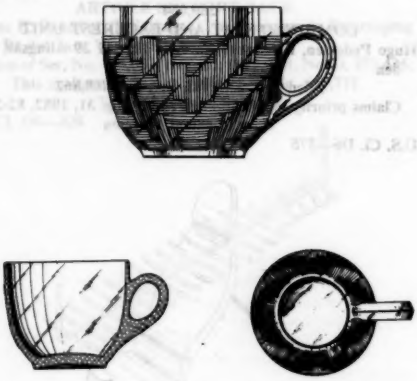
280,054
COMBINED SEAT AND BACKREST UNIT
Hugo Pedersen, Kristineholmsvägen 12, 441 39 Alingsås, Sweden
Filed Feb. 22, 1983, Ser. No. 468,862
Claims priority, application Sweden, Aug. 31, 1982, 82-2079
Term of patent 14 years
U.S. Cl. D6—375

280,055
SOFA
Giovanni Offredi, Milan, Italy, assignor to Saporiti Italia S.p.A., Varese, Italy
Filed Mar. 10, 1983, Ser. No. 474,025
Claims priority, application Italy, Sep. 17, 1982, 6094/82[U]
Term of patent 14 years
U.S. Cl. D6—381

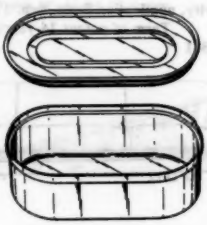


280,056
TUBULAR FRAME ROD FOR A LOUNGE SET
Jan Dranger, Carl Milles väg 7, S-181 34 Lidingö, Sweden
Filed Sep. 23, 1982, Ser. No. 422,496
Claims priority, application Sweden, Mar. 30, 1982, 82-0837
Term of patent 14 years
U.S. Cl. D6—491

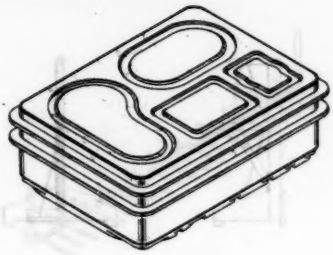
280,057
CUP OR SIMILAR ARTICLE
Philippe J. Durand, Les Daneaux, Chemin de la Garenne, 62510 Argues, France
Filed Aug. 23, 1982, Ser. No. 410,848
Term of patent 14 years
U.S. Cl. D7—9

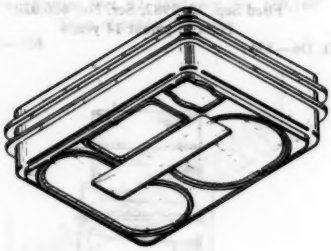


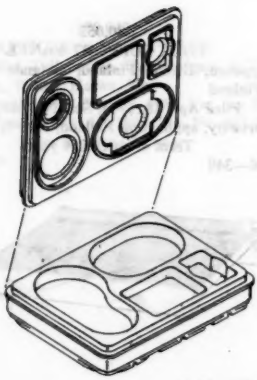
280,058
FOOD CONTAINER WITH PRESS-IN LID
Arthur R. Carlson, East Malvern, Australia, assignor to Brian Davis and Company Proprietary Limited, Scoresby, Australia
Filed Jan. 25, 1982, Ser. No. 342,728
The portion of the term of this patent subsequent to Nov. 30, 1996, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—16



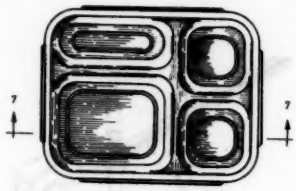
280,059
COMBINED INSULATED FOOD SERVICE TRAY AND COVER
Edgar Otto, Scotch Plains, N.J., assignor to Therma-Tray Corporation, South Plainfield, N.J.
Filed Mar. 7, 1983, Ser. No. 473,075
Term of patent 14 years
U.S. Cl. D7—16







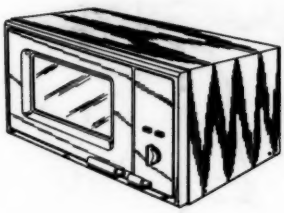
280,060
COMPARTMENTED FOOD TRAY
Michael E. Holzkopf, Libertyville, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.
Filed Jan. 17, 1983, Ser. No. 458,294
Term of patent 14 years
U.S. Cl. D7—38



280,061
PITCHER
Douglas D. Muggiin, 25 Marvin Ave., Walton, N.Y. 13856
Filed Feb. 16, 1983, Ser. No. 467,031
Term of patent 14 years
U.S. Cl. D7—316

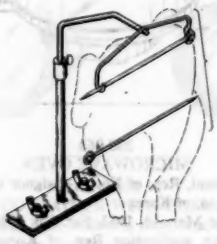
280,062
APPARATUS FOR POPPING CORN
William C. Cesaroni, Glenview, Ill., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Jan. 14, 1983, Ser. No. 458,090
Term of patent 14 years
U.S. Cl. D7—325

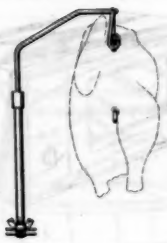
280,063
MICROWAVE OVEN
Jong S. Choi, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Mar. 18, 1983, Ser. No. 476,463
Claims priority, application Rep. of Korea, Oct. 7, 1982, 8819-82
Term of patent 14 years
U.S. Cl. D7—351



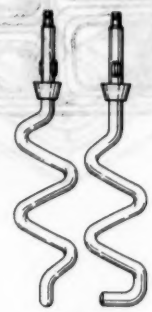
280,064
ELECTRIC RICE COOKER
Takeichi Obata, Hino, and Shinji Oe, Kunitachi, both of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Chiba, Japan
Filed Mar. 9, 1983, Ser. No. 473,859
Term of patent 14 years
U.S. Cl. D7—360

280,065
FOWL ROASTER RACK
Leo C. Pierscinski, 1400 N St., Ste. 5, Sacramento, Calif. 95814
Filed Aug. 26, 1983, Ser. No. 526,749
Term of patent 14 years
U.S. Cl. D7—409





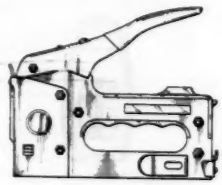
280,066
SET OF DOUGH HOOKS
Reid F. Engstrom, Whitefish Bay, Wis., assignor to Sunbeam Corporation, Oak Brook, Ill.
Filed Jun. 16, 1982, Ser. No. 388,825
Term of patent 14 years
U.S. Cl. D7—412



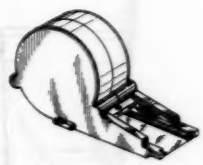
280,067
SEED PLANTER
James H. Patrick, Thunderbird Meadows, Kirkland, Ariz. 96332
Filed Jan. 27, 1983, Ser. No. 461,619
Term of patent 14 years
U.S. Cl. D8—2

280,068
SICKLE GUARD ALIGNING HAND TOOL
John M. Kapphahn, Rte. 1, Elbow Lake, Minn. 56511
Filed Jan. 28, 1983, Ser. No. 461,947
The portion of the term of this patent subsequent to Mar. 13, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—14

280,069
STAPLE GUN HAVING A STAPLE STORAGE COMPARTMENT
George Hillinger, Los Angeles, Calif., assignor to Alltrade Inc., Commerce, Calif.
Filed Aug. 10, 1983, Ser. No. 521,218
Term of patent 14 years
U.S. Cl. D8—49

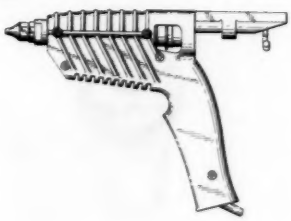


280,070
STAPLE CARTRIDGE
Paul Olesen, Bellmore; Richard J. Pendzich, Brooklyn, and Albert Lensky, Fresh Meadows, all of N.Y., assignors to Swingline Inc., Long Island City, N.Y.
Filed Aug. 30, 1983, Ser. No. 527,770
Claims priority, application Japan, Jun. 30, 1983, 58-28011
Term of patent 14 years
U.S. Cl. D8—49



280,071
RIVET GUN
Richard W. Oefinger, Shelton, Conn., assignor to USM Corporation, Farmington, Conn.
Filed Oct. 12, 1982, Ser. No. 433,691
Term of patent 14 years
U.S. Cl. D8—61

280,072
THERMOPLASTIC DISPENSING DEVICE
Michael M. Dziki, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Jan. 20, 1983, Ser. No. 459,521
Int. Cl. D8—*30;61;68;107*
Term of patent 14 years
U.S. Cl. D8—61



280,073

COMBINED DOOR OPENER AND ESCUTCHEON UNIT

Leo F. Wildgen, Minneapolis, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.

Filed Jan. 7, 1983, Ser. No. 456,516

Term of patent 14 years

U.S. Cl. D8—301

280,074

STORM DOOR HANDLE UNIT

Leo F. Wildgen, Minneapolis, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.

Filed Jan. 7, 1983, Ser. No. 456,515

Term of patent 14 years

U.S. Cl. D8—302

280,075

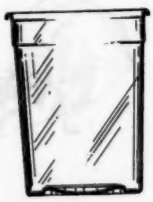
PACKAGING CONTAINER

John H. Haag, Sr., Evansville, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed Apr. 11, 1983, Ser. No. 483,979

Term of patent 14 years

U.S. Cl. D9—370

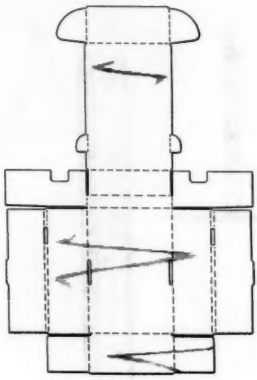


280,076
COMBINED PACKAGING CONTAINER AND LID
John H. Haag, Sr., Evansville, Ind., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 11, 1983, Ser. No. 483,980
Term of patent 14 years
U.S. Cl. D9—370

280,077
BOTTLE
Emile Lemaire, Bassenge, Belgium, assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Nov. 12, 1982, Ser. No. 441,210
Claims priority, application Benelux, May 13, 1982, 02766-00
Term of patent 14 years
U.S. Cl. D9—372

280,078
PACKAGING CUP WITH A PEDESTAL BASE
Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Oct. 15, 1982, Ser. No. 434,698
The portion of the term of this patent subsequent to Jun. 25, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—390

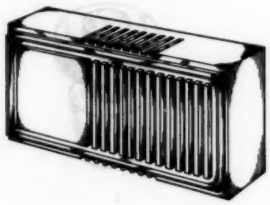
280,079
BLANK FOR A SHIPPING AND DISPLAY CARTON
Brenda K. Levetz, Dallas, Tex., assignor to Anderson, Clayton & Co., Houston, Tex.
Filed Jun. 20, 1983, Ser. No. 505,590
Term of patent 14 years
U.S. Cl. D9—433



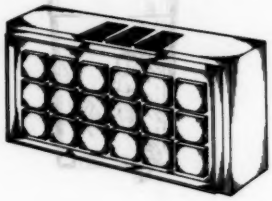
280,080
REUSABLE EXTRACTOR-STOPPER FOR LABORATORY GLASSWARE
Robert J. Miskinis, 10020 Prospect Ave. A15, Santee, Calif. 92071
Filed Jul. 19, 1982, Ser. No. 399,364
Term of patent 14 years
U.S. Cl. D9—439

280,081
COMBINED MEASURING STICK AND BACKSCRATCHER
Robert J. Groves, 5 Ann St., Penthouse 2, Mississauga, Ontario, Canada (L5G 4M1)
Filed Jun. 14, 1983, Ser. No. 504,169
Term of patent 14 years
U.S. Cl. D10—71

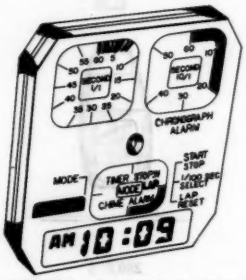
280,082
CHIME COVER PLATE
Monte L. Levin, New York, and John J. Daly, Port Washington, both of N.Y., assignors to Square D Company, Palatine, Ill.
Filed Oct. 20, 1983, Ser. No. 543,726
Term of patent 14 years
U.S. Cl. D10—118



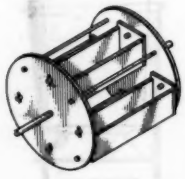
280,083
CHIME COVER PLATE
Monte L. Levin, New York, and John J. Daly, Port Washington, both of N.Y., assignors to Square D Company, Palatine, Ill.
Filed Oct. 20, 1983, Ser. No. 543,732
Term of patent 14 years
U.S. Cl. D10—118



280,084
ELECTRO-OPTIC DISPLAY FOR A TIMEPIECE
Hayao Kano, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jan. 29, 1982, Ser. No. 343,842
Claims priority, application Japan, Oct. 31, 1981, 56-48771
Term of patent 14 years
U.S. Cl. D10—125



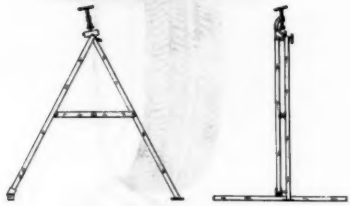
280,085
ROTATABLE PLANTER SUPPORT UNIT
Michael W. O'Connor, 25518 3rd St., Barstow, Calif. 92311
Filed Jan. 21, 1983, Ser. No. 460,129
Term of patent 14 years
U.S. Cl. D11—156



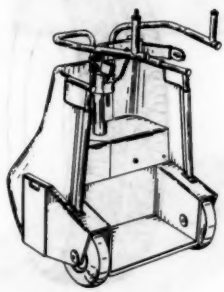
280,086
FIGURINE
Eddie L. Shaw, 8132 Ramsgate Rd., Jacksonville, Fla. 32208
Continuation-in-part of Ser. No. 172,277, Jul. 25, 1980, abandoned. This application Apr. 11, 1983, Ser. No. 483,891
Term of patent 14 years
U.S. Cl. D11—158

280,087
TOY TRICYCLE
Chong Wing-Fong, Hong Kong, Hong Kong, assignor to Playmates Holdings Limited, Hong Kong, Hong Kong
Filed Mar. 14, 1983, Ser. No. 475,150
Claims priority, application United Kingdom, Oct. 7, 1982, 1009130
Term of patent 14 years
U.S. Cl. D12—112

280,088
RACING BICYCLE STAND
Joel T. Shedden, P.O. Box 628, Lake Elsinore, Calif. 92330
Filed May 16, 1983, Ser. No. 494,719
Term of patent 14 years
U.S. Cl. D12—115



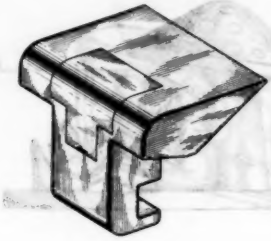
280,089
VEHICLE FOR PARAPLEGIC PERSONS
Peter Blower, Hertfordshire, England, assignor to British Aerospace PLC, London, England
Filed Oct. 21, 1982, Ser. No. 435,737
Term of patent 14 years
U.S. Cl. D12—128



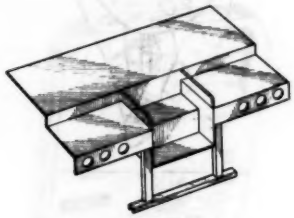
280,090
TIRE TREAD AND BUTTRESS
Maurice Graas, Luxembourg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 24, 1983, Ser. No. 544,675
Term of patent 14 years
U.S. Cl. D12—146

280,091
TIRE
Harold D. Fetty, Birmingham, Mich., and Daniel J. Lindner, Canal Fulton, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 17, 1983, Ser. No. 476,307
Term of patent 14 years
U.S. Cl. D12—147

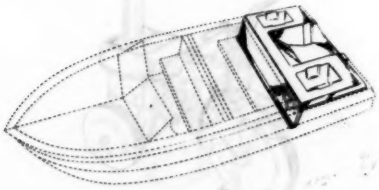
280,092
CAR LUGGAGE CARRIER
Herbert H. McKee, 135 Poplar Ave., NW., Canton, Ohio 44708
Filed Feb. 28, 1983, Ser. No. 470,231
Term of patent 14 years
U.S. Cl. D12—157



280,093
COMBINED TRUCK REAR STEPS AND PLATFORM
Don A. Bresie; Jack M. Burns; Donald W. Fowler, and Marion S. Sheets, all of 5407 N. IH 35, Suite 304, Austin, Tex. 78723
Filed Jan. 28, 1983, Ser. No. 461,898
Term of patent 14 years
U.S. Cl. D12—203



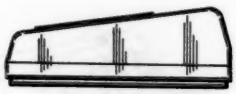
280,094
BOAT MOTOR COMPARTMENT
Tony L. Riviezzo, Elkhart, Ind., assignor to Holiday Rambler Corporation, Wakarusa, Ind.
Filed Jun. 7, 1982, Ser. No. 385,502
Term of patent 14 years
U.S. Cl. D12—318

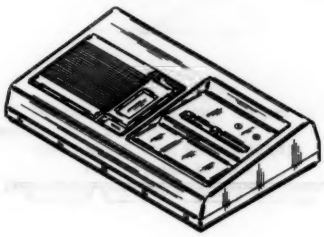


280,095
LIGHT DIMMER SWITCH OR SIMILAR ARTICLE
Lynn Roszel, 1206 Tappan Cir., Carrollton, Tex. 75006
Filed Feb. 28, 1983, Ser. No. 470,060
Term of patent 14 years
U.S. Cl. D13—32

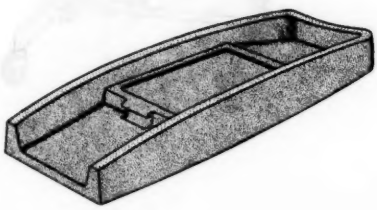
280,096
COMBINED MICROPHONE, AMPLIFIER AND HEADSET
Jack B. Meister, 68 Chimney Ridge, Convent Station, N.J. 07961
Filed Mar. 7, 1983, Ser. No. 472,965
Term of patent 14 years
U.S. Cl. D14—12

280,097
ELECTRONIC INTERCOMMUNICATION UNIT
Hiroshi Yamagata, and Kendo Makihara, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 25, 1983, Ser. No. 497,908
Claims priority, application Japan, Nov. 30, 1982, 57-54178
Term of patent 14 years
U.S. Cl. D14—58





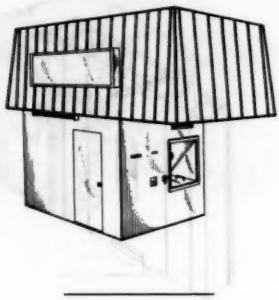
280,098
TELEPHONE STAND OR SIMILAR ARTICLE
John N. McGarvey, Drexel Hill, Pa., and Alvin R. Tilley, Red Bank, N.J., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Jul. 19, 1984, Ser. No. 632,189
Term of patent 14 years
U.S. Cl. D14—60



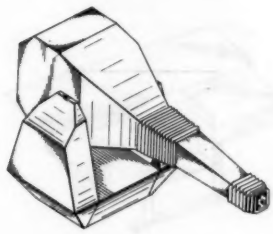
280,099
TELEPHONE KEYPAD FOR A COMBINED RADIO, CLOCK AND TELEPHONE SET
David Topp, Miami, Fla., assignor to Multi-Tech Industries Corp., Miami, Fla.
Continuation-in-part of Ser. No. 601,965, Apr. 19, 1984,. This application Jul. 6, 1984, Ser. No. 628,592
Term of patent 14 years
U.S. Cl. D14—66

280,100
PORTABLE COMPUTER WORK STATION
Joseph L. Ungar, 17120 NE. 96th St., Redmond, Wash. 98052, assignor to Jospeph Lindsay Ungar, Redmond, Wash.
Filed Aug. 19, 1982, Ser. No. 409,760
Term of patent 14 years
U.S. Cl. D14—103

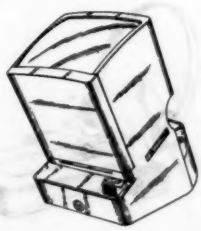
280,101
MACHINE FOR RECEIVING USED CANS
Layle B. Barker, Richmond; Frederick R. Fleischman, Goochland County, and George F. Swenck, Henrico County, all of Va., assignors to Reynolds Metals Company, Richmond, Va.
Filed Dec. 9, 1982, Ser. No. 448,397
Term of patent 14 years
U.S. Cl. D15—123



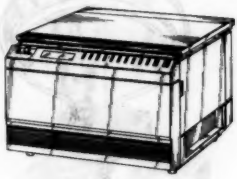
280,102
ROBOT
Ray Hicks, 3101 Corunna Rd., Flint, Mich. 48503
Filed Mar. 7, 1983, Ser. No. 461,624
Term of patent 14 years
U.S. Cl. D15—199



280,103
SLIDE VIEWER
Francis Bonnefoy, Fontainebleau, France, assignor to Posso S.A., France
Filed Feb. 23, 1983, Ser. No. 469,049
Claims priority, application Hague, Dec. 2, 1982, DM/002023
Term of patent 14 years
U.S. Cl. D16—17



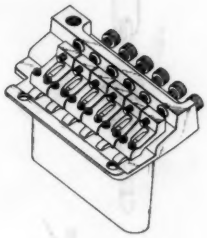
280,104
ELECTRONIC COPYING MACHINE
Shigeru Sutoh, Urawa, and Hideyuki Horie, Kamagaya, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed May 9, 1983, Ser. No. 492,718
Claims priority, application Japan, Nov. 10, 1982, 57-50472
Term of patent 14 years
U.S. Cl. D16—31



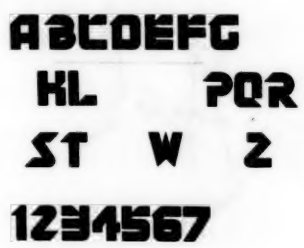
280,105
COVER FOR A FIELD CAMERA FOCUS PLATE
Douglas I. Busch, 3828 Crosby St., Rockford, Ill. 61107
Filed Mar. 21, 1983, Ser. No. 477,524
Term of patent 14 years
U.S. Cl. D16—38

280,106
EYEGLASS FRAME
Ulrich J. Haas, Vienna, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Nov. 2, 1983, Ser. No. 547,837
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1983, 11ar2596/83; Sep. 28, 1983, 11ar3292/83
Term of patent 14 years
U.S. Cl. D16—102

280,107
ELECTRIC GUITAR TREMOLO UNIT
Yuji Tanaka, Akishima, and Hideo Matsumoto, Shizuoka, both of Japan, assignors to Tokai Gakki Co., Ltd., Japan
Filed Mar. 23, 1983, Ser. No. 478,153
Claims priority, application Japan, Dec. 31, 1982, 57-58619
Term of patent 14 years
U.S. Cl. D17—21



280,108
FRONT OF TYPE
William E. Shuman, Evansville, Ind., assignor to American Standard Inc., New York, N.Y.
Filed Aug. 11, 1983, Ser. No. 522,426
Term of patent 14 years
U.S. Cl. D18—24



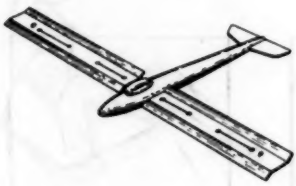
280,109
CLEANING CARD FOR INK JET PRINT HEAD OR SIMILAR ARTICLE
Arthur M. Lewis, and Aldo Scudo, both of Ridgefield, Conn., assignors to Exxon Research and Engineering Co., Florham Park, N.J.
Filed Feb. 17, 1983, Ser. No. 467,423
Term of patent 14 years
U.S. Cl. D18—99

280,110
WRITING INSTRUMENT
Loren L. Brooks, 1967 SE. 28th, Portland, Oreg. 97214
Filed Feb. 14, 1983, Ser. No. 466,019
Term of patent 14 years
U.S. Cl. D19—42

280,111
HOLDER FOR FLAT ARTICLES SUCH AS DISPLAY CARDS OR THE LIKE
Robert M. Brus, Apple Valley, Minn., assignor to The Toro Company, Minneapolis, Minn.
Filed Apr. 4, 1983, Ser. No. 481,560
Term of patent 14 years
U.S. Cl. D20—43

280,112
PLAYING CARD HOLDER
Philip C. Calabro, East Greenwich, R.I., assignor to Job, Inc., East Greenwich, R.I.
Filed Mar. 30, 1983, Ser. No. 481,052
Term of patent 14 years
U.S. Cl. D21—54

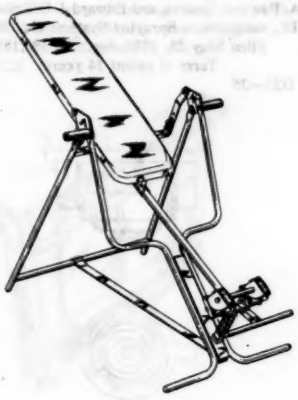
280,113
TOY AIRCRAFT
Hendrick J. G. Lorist, Santa Clara, Calif., assignor to Tolsir Products, Santa Clara, Calif.
Filed Dec. 12, 1983, Ser. No. 560,545
Term of patent 14 years
U.S. Cl. D21—88



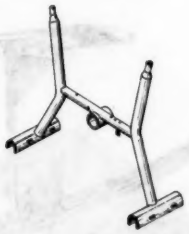
280,114
COMBINED TOY VEHICLE AND RIDER FIGURE
Kunio Miyazaki, and Shiro Ito, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jul. 27, 1982, Ser. No. 402,289
Claims priority, application Japan, Jan. 29, 1982, 57-3764
Term of patent 14 years
U.S. Cl. D21—134

280,115
TOY TRUCK
Kazutaka Takeuchi, Murakami Yachiyo, Japan, assignor to Blue Box Toy Factory Limited, Hong Kong
Filed Nov. 26, 1982, Ser. No. 444,544
Claims priority, application United Kingdom, Jul. 8, 1982, 1007605
Term of patent 14 years
U.S. Cl. D21—139

280,116
THERAPEUTIC EXERCISER OR SIMILAR ARTICLE
Wayne H. McGowen, 4930 Mill Creek, Dallas, Tex. 75234
Filed Oct. 21, 1983, Ser. No. 544,277
Term of patent 14 years
U.S. Cl. D21—191



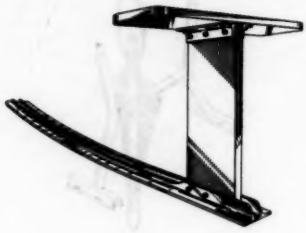
280,117
FRAME FOR EXERCISE CYCLE
Gerald W. Collins, Cudahy, Wis., assignor to Huffy Corporation, Dayton, Ohio
Filed May 5, 1983, Ser. No. 491,826
Term of patent 14 years
U.S. Cl. D21—194



280,118
FRAME FOR EXERCISE CYCLE
Gerald W. Collins, Cudahy, Wis., assignor to Huffy Corporation, Dayton, Ohio
Filed May 5, 1983, Ser. No. 491,825
Term of patent 14 years
U.S. Cl. D21—194

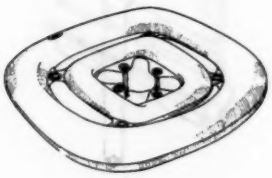
280,119
GOLF PUTTER GRIP
Kirk M. McRae, 2963 Country Club Dr., Cameron Park, Calif. 95682
Filed Apr. 21, 1983, Ser. No. 487,323
Term of patent 14 years
U.S. Cl. D21—222

280,120
RIDING TYPE SKI
Larry L. Decker, and Roger L. Decker, both of Canton, Ohio, assignors to Gyro Manufacturing, Inc., Canton, Ohio
Filed Apr. 4, 1983, Ser. No. 481,873
Term of patent 14 years
U.S. Cl. D21—229

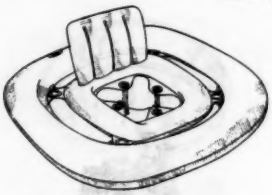


280,121
HAND GRIP AID FOR GOLF
Leroy J. Klein, 4525 Brookshire Cir., Fort Wayne, Ind. 46815
Filed Jun. 20, 1983, Ser. No. 505,880
Term of patent 14 years
U.S. Cl. D21—234

280,122
FLOATING SEAT
Klaus P. H. Maertin, 7 Villiers Pl., Dee Why West, New South Wales 2099, Australia
Filed Sep. 20, 1982, Ser. No. 420,204
Term of patent 14 years
U.S. Cl. D21—237

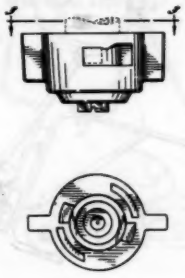


280,123
FLOATING SEAT WITH BACKREST
Klaus P. H. Maertin, 7 Villiers Place, Dee Why West, New South Wales 2099, Australia
Filed Sep. 20, 1982, Ser. No. 420,205
Term of patent 14 years
U.S. Cl. D21—237

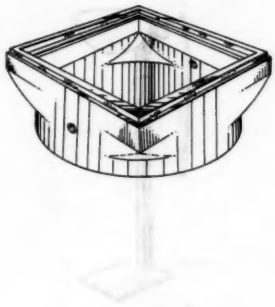


280,124
FISHING LINE SPOOL HOLDER
Richard D. Collins, 1511 Woodview West, Eagan, Minn. 55122
Filed Feb. 16, 1983, Ser. No. 466,852
Term of patent 14 years
U.S. Cl. D22—25

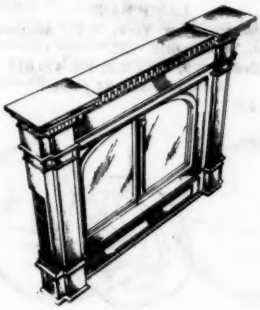
280,125
COMBINED CAP AND SPRAY TIP FOR SPRAY NOZZLE ASSEMBLY
Ted Butterfield, Naperville; George E. Bird, Hickory Hills; Gary A. Paulsen, Geneva, and Edward J. O'Brien, Barrington, all of Ill., assignors to Spraying Systems Co., Wheaton, Ill.
Filed May 28, 1982, Ser. No. 383,189
Term of patent 14 years
U.S. Cl. D23—35



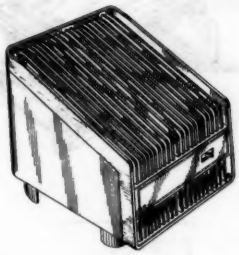
280,126
PRECAST DRAIN INLET
William R. Provan, Napa, and Douglas P. Allard, Sonoma, both of Calif., assignors to Central States Concrete Products, Inc., Napa, Calif.
Filed Jun. 20, 1983, Ser. No. 506,097
Term of patent 14 years
U.S. Cl. D23—45



280,127
FIREPLACE FRONT
Duncan C. Syme, Norwich, and Vance R. Smith, Randolph, both of Vt., assignors to Vermont Castings, Inc., Randolph, Vt.
Filed May 11, 1983, Ser. No. 493,665
Term of patent 14 years
U.S. Cl. D23—128



280,128
AIR CLEANER
Edward J. Doyle, Hatboro, Pa., and James M. Rittenhouse, Watchung, N.J., assignors to Conair Corporation, Edison, N.J.
Filed Mar. 14, 1983, Ser. No. 476,023
Term of patent 14 years
U.S. Cl. D23—149

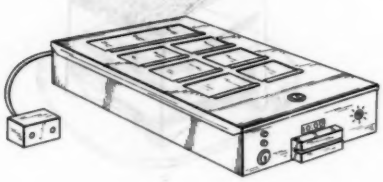


280,129
AIR FILTER
Edward J. Doyle, Hatboro, Pa., assignor to Conair Corporation, Edison, N.J.
Filed Mar. 28, 1983, Ser. No. 479,886
Term of patent 14 years
U.S. Cl. D23—149

280,130
MAGNETIC SEPARATOR
Jack R. Harkins, Hollis; Henry J. Rahn, Sharon, and David E. Roche, Nashua, all of N.H., assignors to Corning Glass Works, Corning, N.Y.
Filed Sep. 9, 1983, Ser. No. 531,162
Term of patent 14 years
U.S. Cl. D24—21

280,131
CASE FOR A MULTIPLICITY OF LIQUID SAMPLE CONTAINERS FOR A MULTITEST CHEMISTRY ANALYZER
Noboru Takasugi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Japan
Filed Oct. 7, 1982, Ser. No. 433,267
Claims priority, application Japan, Apr. 10, 1982, 57-15434
Term of patent 14 years
U.S. Cl. D24—31

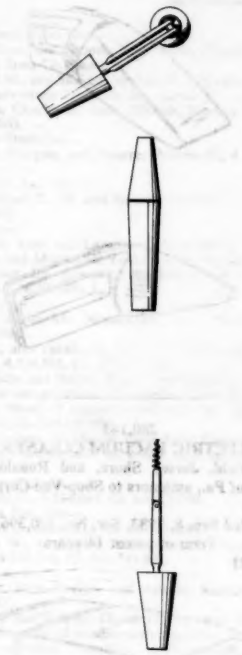
280,132
COMPARTMENTAL MEDICINE DISPENSER
John T. McLaughlin, Glendale, Calif., assignor to Macma Incorporated, Costa Mesa, Calif.
Filed Dec. 2, 1982, Ser. No. 446,340
Term of patent 14 years
U.S. Cl. D24—31



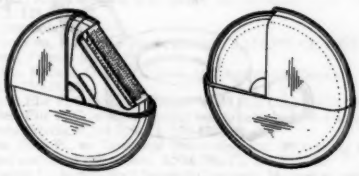
280,133
UPLIGHTING LAMP
Laurence R. Cocking, 42, Gorst Rd., London NW 10 6LD, England
Filed Jun. 10, 1983, Ser. No. 503,020
Claims priority, application United Kingdom, Dec. 21, 1982, 1010432
Term of patent 14 years
U.S. Cl. D26—105

280,134
LAMP BASE
Sante G. Alessandro, New York, N.Y., assignor to Erwin-Lambeth, Inc., Thomasville, N.C.
Filed Jun. 9, 1983, Ser. No. 479,013
Term of patent 14 years
U.S. Cl. D26—106

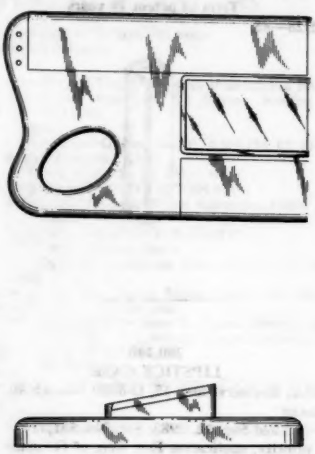
280,135
COMBINED COSMETIC CONTAINER AND APPLICATOR CAP
Gino H. Cassai, 924 E. 96th St., Brooklyn, N.Y. 11236, and Henry J. Cassai, 163-47 85 St., Howard Beach, N.Y. 11414
Filed Aug. 10, 1982, Ser. No. 406,938
Term of patent 14 years
U.S. Cl. D28—7



280,136
ELECTRIC SHAVER
Hiroshi Yajima, Osaka; Kazuo Takada, Nara; Yuichiro Yamawaki, Osaka; Teruaki Egashira, Osaka; Nobuo Matsui, Osaka, and Toyomi Arita, Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan
Filed Aug. 4, 1983, Ser. No. 520,106
Claims priority, application Japan, Feb. 4, 1983, 58-4363
Term of patent 14 years
U.S. Cl. D28—49



280,137
PALETTE FOR FACIAL MAKEUP
Mark B. Guttenplan, and Paul H. Friedman, both of New York, N.Y., assignors to Art Eyes, Inc., New Rochelle, N.Y.
Filed Jan. 20, 1983, Ser. No. 459,520
Term of patent 14 years
U.S. Cl. D28—76



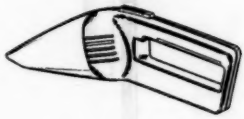
280,138
COSMETIC CASE
Dieter Bakic, Roemerstrasse 15, D-8000 Munich 40, Fed. Rep. of Germany
Filed Sep. 12, 1983, Ser. No. 531,472
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 11AR892/83
Term of patent 14 years
U.S. Cl. D28—83

280,139
LIPSTICK CASE
Dieter Bakic, Roemerstrasse 15, D-8000 Munich 40, Fed. Rep. of Germany
Filed Sep. 12, 1983, Ser. No. 531,333
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 11AR892/83
Term of patent 14 years
U.S. Cl. D28—85

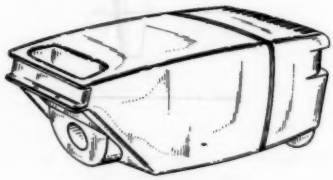
280,140
LIPSTICK CASE
Dieter Bakic, Roemerstrasse 15, D-8000 Munich 40, Fed. Rep. of Germany
Filed Sep. 12, 1983, Ser. No. 531,334
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 11 AR 892/83
Term of patent 14 years
U.S. Cl. D28—85

280,141
LIPSTICK TUBE
Thomas F. Holloway, Southbury, Conn., assignor to Risdon Corporation, Naugatuck, Conn.
Filed Aug. 31, 1983, Ser. No. 528,089
Term of patent 14 years
U.S. Cl. D28—89

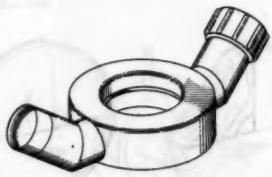
280,142
PORTABLE VACUUM CLEANER
Horst Pudwill, Kowloon, Hong Kong, assignor to Continental Engineering Products, Hong Kong, Hong Kong
Filed Oct. 17, 1983, Ser. No. 542,811
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1983, URA459/83
Term of patent 14 years
U.S. Cl. D32—18



280,143
ELECTRIC VACUUM CLEANER
Robert C. Berfield, Jersey Shore, and Ronald F. Meland, Muncy, both of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.
Filed Sep. 8, 1983, Ser. No. 530,396
Term of patent 14 years
U.S. Cl. D32—21



280,144
PAINT ROLLER CLEANING DEVICE
James J. Cooney, 763 Sapphire St., San Diego, Calif. 92109
Filed Aug. 17, 1983, Ser. No. 524,018
Term of patent 14 years
U.S. Cl. D32—35



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF AUGUST, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Schneck, Hans; and Tiitinen, Esko, 4,534,151, Cl. 53-415.000.

A. J. Sackett & Sons Co.: *See*—
Alt, Daniel M.; and Sackett, Michael J., 4,534,654, Cl. 366-137.000.

A. O. Smith Harvestore Products, Inc.: *See*—
Silverthorn, Charles R.; and Allhands, Marcus N., 4,534,461, Cl. 198-592.000.

A/S Loegstrup-Steel: *See*—
Loegstrup, Joergen; and Sparre, Preben C., 4,534,612, Cl. 339-255.00P.

A. T. Newell Co. Inc.: *See*—
Newell, Alfred T., III; and Newell, Alfred T., Jr., 4,534,406, Cl. 165-12.000.

AB Volvo: *See*—
Remmerfelt, Arne; and Larsson, Sten, 4,534,241, Cl. 74-597.000.

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Abe, Masaki: *See*—
Shimizu, Hiroshi; Abe, Masaki; and Sato, Akihiro, 4,535,069, Cl. 502-115.000.

Abe, Tadafumi; and Takahashi, Isao, to Tachikawa Spring Co., Ltd. Vehicle seat. 4,534,595, Cl. 297-452.000.

Abolins, Visvaldis; and Holub, Fred F., to General Electric Company. Thermoplastic compositions of polyphenylene ether resin and precompounded blend of organopolysiloxane and poly(arylolefin-olefin). 4,535,106, Cl. 524-151.000.

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Colliau, Joel D., 4,534,683, Cl. 408-17.000.

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Ackley, James W., to Varian Associates, Inc. Load lock pumping mechanism. 4,534,314, Cl. 118-733.000.

Adachi, Kuniomi: *See*—
Sawa, Yuji; Itoh, Toshio; and Adachi, Kuniomi, 4,534,155, Cl. 53-459.000.

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Washecheck, Don M.; and Adams, Charles T., 4,534,852, Cl. 208-89.000.

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Gagas, Michael S.; and Gagas, Stanley J., 4,534,378, Cl. 137-367.000.

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Adair, Paul C.; and Adkins, David G., 4,535,050, Cl. 430-138.000.

Adkins, Jean. Thimble. 4,534,495, Cl. 223-101.000.

Advanced Micro Devices, Inc.: *See*—
Chen, Pau-Ling, 4,534,824, Cl. 156-628.000.

Advanced Technology, Inc.: *See*—
Intrater, Josef; and Bertoldo, Gene, 4,535,029, Cl. 428-408.000.

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Powers, Jeffry E., 4,534,357, Cl. 128-663.000.

Aerospace Optics, Inc.: *See*—
Guthrie, Don W., 4,535,396, Cl. 362-293.000.

Affeldt, Karl-Heinz: *See*—
Berger, Klaus; Affeldt, Karl-Heinz; and Bottcher, Lutz, 4,534,361, Cl. 128-680.000.

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Norrstrom, Hans; and Idner, Kristina, 4,534,397, Cl. 162-23.000.

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Ishida, Keiichi; Okumura, Junji; and Agetsuma, Fumio, 4,534,506, Cl. 236-35.300.

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Carre , Christian; and Guibet, Jean P., 4,534,778, Cl. 55-340.000.

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Nishii, Michiharu, 4,534,270, Cl. 91-376.00R.

Aisin Warner Kabushiki Kaisha: *See*—
Yokoyama, Shoji; and Sakakibara, Shiro, 4,534,243, Cl. 74-868.000.

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Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, 4,534,435, Cl. 180-140.000.

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Akio, Kimura: *See*—
Toshimasa, Kuroda; Akio, Kimura; Takumi, Horiuchi; Koki, Sasaki; and Terukuni, Ikuta, 4,534,164, Cl. 57-290.000.

Akkala, Walter I. Self sealing vacuumed package. 4,534,152, Cl. 53-434.000.

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Winstrom-Olsen, Bjarne, 4,534,800, Cl. 127-12.000.

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Field, David J.; Butler, Ernest P.; and Bassett, Katherine-Ann, 4,534,807, Cl. 148-20.300.
Tracy, John A., 4,534,092, Cl. 29-21.100.

Aldrich, Allyn M., to Sundstrand Corporation. Position and control system for helicopter blade actuation. 4,534,524, Cl. 244-17.250.

Aldrich, Warren: *See*—
Aldrich, Warren S.; and Ingersoll, Brian, 4,534,858, Cl. 209-236.000.

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Alessio, Enzo: *See*—
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Munde, Jan, 4,534,570, Cl. 277-95.000.

Allan, David E.; and Martinez, Charles H., to Exxon Research and Engineering Co. Feed injection method to prevent coking on the walls of transfer line reactors. 4,534,851, Cl. 208-48.00R.

Allan, David T. Tool assembly. 4,534,421, Cl. 173-130.000.

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Frey, Sydney W., Jr.; and Herson, Mark I., 4,535,386, Cl. 361-389.000.

Allhands, Marcus N.: *See*—
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Allied Corporation: *See*—
Colby, Lewis J., Jr., 4,535,047, Cl. 430-108.000.
Johnson, Edwin A., 4,535,406, Cl. 364-431.080.
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Yoshisato, Akiyuki; and Iijima, Kohta, 4,535,435, Cl. 369-126.000.

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Huet, Roger, 4,534,266, Cl. 89-36.020.

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ALZA Corporation: *See*—
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Taguchi, Masayuki, 4,534,247, Cl. 83-13.000.

Ambrose, John; Charles, Douglas K.; Conard, Bruce R.; Diaz, Carlos; O'Neill, Charles E.; and Leavoy, Wayne P., to INCO Limited. Manufacturing of titanium anode substrates. 4,534,935, Cl. 419-23.000.

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Amcodyne Incorporated: *See*—
Anderson, Kurt M.; and Morehouse, James H., 4,535,374, Cl. 360-103.000.

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American Cyanamid Company: *See*—
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AMP Incorporated: *See*—
Bowen, Terry P.; Caron, Bernard G.; Cooper, Ronald F.; and Glover, Douglas W., 4,534,616, Cl. 350-96.200.
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Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Hirobe, Hitoshi, 4,535,364, Cl. 358-228.000.
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Tabata, Yasushi; Ogawa, Kimiaki; and Takahashi, Toshimitsu, 4,534,634, Cl. 354-268.000.

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Asai, Isao: *See*—
Muramatsu, Shigeru; Asai, Isao; and Morita, Takayuki, 4,534,517, Cl. 242-35.50A.

Asakawa, Teruo, to Telmec Co., Ltd. Two-dimensional precise positioning device for use in a semiconductor manufacturing apparatus. 4,535,278, Cl. 318-687.000.

Asano, Hiroshige; and Moroto, Masayuki, to Okuma Machinery Works Ltd. Method of cleaning machined surface and chip removing tool. 4,534,803, Cl. 134-30.000.

ASEA Aktiebolag: *See*—
Lindqvist, Ake, 4,535,207, Cl. 200-17.00R.

ASM Fico Tooling, b.v.: *See*—
Fierkens, Richardus H. J.; and Pas, Ireneus J. T. M., 4,534,921, Cl. 264-39.000.

Aspenwall, John E., to Jahabow Industries, Inc. Fluorescent lamp housing. 4,535,393, Cl. 362-217.000.

Assandri, Alessandro: *See*—
Galliani, Giulio; Omodei-Sale, Amedeo; Consonni, Pietro; and Assandri, Alessandro, 4,535,090, Cl. 514-383.000.

AT&T Bell Laboratories: *See—*
Baxter, Leslie A.; and Brown, Sanford S., 4,535,448, Cl. 370-85.000.
Briley, Bruce E.; and Hiltner, Jeffrey A., 4,535,360, Cl. 358-181.000.
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Cho, Alfred Y.; Glance, Bernard; Lubzens, Daniel; and Schneider, Martin V., 4,534,103, Cl. 29-571.000.
Falconer, David D., 4,535,206, Cl. 179-170.200.
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Ohm, Edward A., 4,535,338, Cl. 343-781.0CA.
Peterson, Donald W., 4,535,455, Cl. 371-13.000.
Smith, Arnold R., 4,534,586, Cl. 292-228.000.
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Lane, Michael S.; and Scholbrock, Steven D., 4,535,445, Cl. 370-62.000.

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Buzzard, Clair A.; and Miaa, Kent V., 4,535,454, Cl. 370-110.200.
Squicciarini, Gaetano N., 4,535,198, Cl. 179-2.0DP.
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AT&T Nassau Metals Corporation: *See—*
Budzich, Mieczlyslaw; and Fitz, Forest G., Jr., 4,534,254, Cl. 83-425.200.

Atkinson, Alan W.; Dearden, Katryna J.; and Lancaster, Janet M., to T&N Materials Research Limited. Gaskets. 4,534,922, Cl. 264-119.000.

Atlantic Richfield Company: *See—*
Piurek, Walter J., 4,534,502, Cl. 228-102.000.

Audiau, Francois; Gueremy, Claude G. A.; and Le Fur, Gerard R., to Pharmuka Laboratoires. Derivatives of 2-piperazino-pyrimidine, methods for their preparation and their utilization as drugs or intermediates for drugs. 4,535,080, Cl. 514-255.000.

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August, Melvin C.; and Williams, John T., to Cray Research, Inc. Circuit module with enhanced heat transfer and distribution. 4,535,385, Cl. 361-388.000.

Australian Atomic Energy Commission: *See—*
Eberhardt, John E., 4,535,241, Cl. 250-339.000.

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Stade, Kurt, 4,534,652, Cl. 366-85.000.

Autry Industries, Inc.: *See—*
Autry, James C., 4,534,121, Cl. 36-35.00R.

Autry, James C., to Autry Industries, Inc. Insole with concentric circular heel structure. 4,534,121, Cl. 36-35.00R.

Avery, Robert W., to Fairey Hydraulics, Ltd. Electric D.C. motors with a plurality of units, each including a permanent magnet field device and a wound armature for producing poles. 4,535,263, Cl. 310-112.000.

Awerbuch, Leon; and Van der Mast, Victor C., to Bechtel International Corporation. Geothermal reboiler apparatus and method. 4,534,174, Cl. 60-641.500.

Axen, Rolf E.; Kaj, Goran L.; and Rigner, Bror S., to Pharmacia AB. Method of forming polymeric layers. 4,535,010, Cl. 427-246.000.

Aydin, Kemal, to Kadex, Incorporated. Electronic lock system. 4,534,194, Cl. 70-278.000.

B. F. Goodrich Company, The: *See—*
Fisher, John M., 4,534,445, Cl. 182-48.000.
Myers, Ronald E., 4,535,147, Cl. 528-321.000.

Babet, Jean-Michel: *See—*
Thibonnet, Bernard, 4,534,408, Cl. 165-108.000.

Bacon, David L.; Kremer, Richard D.; and Morse, Randall H., to Schleicher & Schuell, Inc. Centrifugal filtering device and filter unit therefor. 4,534,863, Cl. 210-232.000.

Bakshi, Kiran R.; Barie, Walter P.; and Sabourin, Edward T., to Gulf Oil Corporation. Method of preparation of polyimide acids. 4,535,115, Cl. 524-376.000.

Ball Corporation: *See—*
Brighton, Andrew P., 4,535,239, Cl. 250-339.000.

Ballard, Stephen C.: *See—*
Payet, George L.; and Ballard, Stephen C., 4,534,819, Cl. 156-515.000.

Bally Midway Mfg. Co.: *See—*
White, Johnnie W., 4,534,609, Cl. 339-117.00R.

Baltz, Robert J.: *See—*
Boggs, John A.; and Baltz, Robert J., 4,534,488, Cl. 220-323.000.

Balz, Werner: *See—*
Roller, Hermann; Lehner, August; Hack, Joachim; Grau, Werner; Balz, Werner; and Baur, Reinhold, 4,534,999, Cl. 427-130.000.

Ban, Keisuke; and Daimaru, Akimasa, to Honda Giken Kogyo Kabushiki Kaisha. Method for making a reinforced article for an internal combustion engine. 4,534,400, Cl. 164-97.000.

Banasiak, Dennis S.: *See—*
Johnson, Timothy W.; and Banasiak, Dennis S., 4,535,116, Cl. 524-385.000.

Baney, Ronald H., to Dow Corning Corporation. Method for preparing silicon carbide. 4,534,948, Cl. 423-345.000.

Barbulescu, Adrian; Boulet, Rodrique; and Lessard, Denis, to Centre de Recherche Industrielle du Quebec. System and method for extracting liquid from a humid mass by compression. 4,534,868, Cl. 210-780.000.

Barer, Sol J.: *See—*
Hsieh, Jih-Han; Barer, Sol J.; and Maxwell, Peter C., 4,535,059, Cl. 435-142.000.

Barge, Fred H. Reclining radiographic wall table. 4,534,076, Cl. 5-147.000.

Barie, Walter P.: *See—*
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Barlian, Reinhold. Device for detecting vapor leakages. 4,534,662, Cl. 374-4.000.

Barnes, Robert A.: *See—*
Frantz, Keith R.; Barnes, Robert A.; and Marks, Bruce G., 4,535,270, Cl. 315-8.000.

Barrows, Thomas H., to Minnesota Mining and Manufacturing Company. Absorbable sutureless nerve repair device. 4,534,349, Cl. 128-334.00R.

Bart, Gordon B.; Hiemstra, Carol L.; and Tyo, James H., to Camp International, Inc. Gravity lumbar reduction maintenance apparatus. 4,534,341, Cl. 128-75.000.

Barth, Gerald D., to Illinois Tool Works Inc. Assymetrically shaped thread forming screw and method of making same. 4,534,690, Cl. 411-386.000.

Barth, Stanley D.: *See—*
Meyer, John J.; and Barth, Stanley D., 4,535,214, Cl. 219-60.200.

Bartlett, James V. Biohazard waste container. 4,534,489, Cl. 220-404.000.

BASF Aktiengesellschaft: *See—*
Bung, Richard; Gans, Karl; Schreyer, Gerold; and Welzel, Gerhard, 4,534,720, Cl. 425-7.000.
Haas, Franz; Janisch, Gerhard; and Schreyer, Gerold, 4,535,004, Cl. 427-212.000.
Haas, Franz; Janisch, Gerhard; and Schreyer, Gerold, 4,535,005, Cl. 427-212.000.
Kretschmer, Alfred, 4,534,308, Cl. 118-260.000.
Naarmann, Herbert; and Koehler, Gernot, 4,535,039, Cl. 429-213.000.
Roller, Hermann; Lehner, August; Hack, Joachim; Grau, Werner; Balz, Werner; and Baur, Reinhold, 4,534,999, Cl. 427-130.000.

BASF Wyandotte Corporation: *See—*
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Reichel, Curtis J., 4,535,178, Cl. 560-91.000.
Schmolka, Irving R., 4,534,959, Cl. 424-45.000.

Bass, David L. Anti-kerf bind device. 4,534,112, Cl. 30-383.000.

Bassett, Katherine-Ann: *See—*
Field, David J.; Butler, Ernest P.; and Bassett, Katherine-Ann, 4,534,807, Cl. 148-20.300.

Bateman, Ivor: *See—*
Morey, Norval K.; and Bateman, Ivor, 4,534,390, Cl. 144-373.000.

Bates, Jack; and Clayson, Arthur E., to United States of America, Navy. Sabot diverter. 4,534,265, Cl. 89-14.600.

Batey, Jonathan H., to VG Instruments Group Limited. Apparatus for and method of operating quadrupole mass spectrometers in the total pressure mode. 4,535,236, Cl. 250-292.000.

Bathe, John G., to ACF Industries, Inc. Apparatus controlling discharge volume of a carburetor accelerator pump. 4,534,913, Cl. 261-34.00B.

Bauer, Bernhard: *See—*
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Bauer, Kurt; Fischer, Karl-Heinz; and Huber, Heinz, to Robert Bosch GmbH. Method of detecting execution errors in program-controlled apparatus. 4,535,456, Cl. 371-16.000.

Baughman, Gary M.: *See—*
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Baur, Reinhold: *See—*
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Baxter, Leslie A.; and Brown, Sanford S., to AT&T Bell Laboratories. Dual bus communication system. 4,535,448, Cl. 370-85.000.

Bayer Aktiengesellschaft: *See—*
Behre, Horst; Blank, Heinz U.; Burmeister, Gerhard; and Lindner, Otto, 4,534,905, Cl. 260-505.00C.
Benz, Gunter; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,535,083, Cl. 514-274.000.
Binsack, Rudolf; Rempel, Dieter; Lindner, Christian; and Morbitzer, Leo, 4,535,124, Cl. 525-67.000.
Brauer, Wolfgang; Korte, Siegfried; Neukam, Theo; and Suling, Carlhans, 4,535,139, Cl. 526-287.000.
Ebert, Wolfgang; Meyer, Rolf-Volker; Idel, Karsten-Josef; and Dhein, Rolf, 4,535,149, Cl. 528-388.000.
Ippen, Jakob; and Stuttgen, Friedel, 4,534,393, Cl. 152-524.000.
Maurer, Fritz; Homeyer, Bernhard; and Becker, Benedikt, 4,535,091, Cl. 514-407.000.
Perrey, Hermann; and Matner, Martin, 4,535,111, Cl. 524-199.000.
Preuss, Reinhard; Perrey, Hermann; Ritter, Helmut; Reinecke, Paul; and Brandes, Wilhelm, 4,535,074, Cl. 514-93.000.
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BBC Brown, Boveri & Company, Limited: *See—*
Horler, Hansulrich; and Perego, Ambrogio, 4,534,700, Cl. 415-135.000.

BBC Industries, Inc.: *See—*
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Bearrs, James G.: *See—*
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Beatrice Foods Co.: *See—*
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Bechtel International Corporation: *See—*
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Bechtel, Peter: *See—*
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Stephens, Donald E.; and Ehret, Robert J., 4,534,941, Cl. 422-70.000.
Wedemeyer, Robert C.; and Giebeler, Robert H., Jr., 4,534,861, Cl. 210-168.000.
Bedford, Richard T. Reflective safety belt. 4,534,619, Cl. 350-98.000.
Beecham Group Limited: *See—*
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Beesley, Casper R. Guides for color grading faceted gemstones. 4,534,644, Cl. 356-30.000.
Beestman, George B., to Monsanto Co. High concentration encapsulation of water solubie-materials. 4,534,783, Cl. 71-27.000.
Behre, Horst; Blank, Heinz U.; Burmeister, Gerhard; and Lindner, Otto, to Bayer Aktiengesellschaft. Process for the preparation of nitronaphthalene-sulphonic acids. 4,534,905, Cl. 260-505.00C.
Beihammer, Horst: *See—*
Hegemann, Fritz; and Beihammer, Horst, 4,534,418, Cl. 172-708.000.
Belani, Jadish G.: *See—*
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Belko, Robert P.: *See—*
Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,534,890, Cl. 252-522.00R.
Belter, Jerome G., to Dana Corporation. Port baffle for engine gasket. 4,534,572, Cl. 277-235.00B.
Ben-Gurion University of the Negev Research & Development Authority: *See—*
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Beneze , Heinz W.: *See—*
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Benezra, Leo L.: *See—*
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Bentley Laboratories, Inc.: *See—*
Raible, Donald A., 4,534,760, Cl. 604-175.000.
Raible, Donald A., 4,534,761, Cl. 604-175.000.
Benuzzi, Gino. Device for making a groove in the edge of a panel. 4,534,256, Cl. 83-863.000.
Benz, Gunter; Metzger, Karl G.; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. Cleavage products of 4',6'-didesoxy-4'-thio-,6'-amino-hepturonic acid nucleosides. 4,535,083, Cl. 514-274.000.
Berger, Kenneth R.: *See—*
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Berger, Klaus; Affeldt, Karl-Heinz; and Bottcher, Lutz, to Robert Bosch GmbH. Method and apparatus for measuring blood pressure by instantaneous comparison of multiple frequency-range components of Korotkoff noise. 4,534,361, Cl. 128-680.000.
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Bergquist, Lyle E., to Martin Marietta Corporation. Calibration method for ultra sensitive noble gas leak detector. 4,534,204, Cl. 73-1.00G.
Bergveld, Piet: *See—*
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Bergwerksverband GmbH: *See—*
Kemper, Franz, 4,534,597, Cl. 299-81.000.
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Berns, Harald, to Johann Knupp GmbH & Co. Device for marking the height above the floor of the edges of articles of clothing. 4,534,501, Cl. 227-65.000.
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Berry, James B.; and Spector, George. Ear frame. 4,534,185, Cl. 63-1.00R.
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Bilow, Norman; and Hermansen, Ralph D., to Hughes Aircraft Company. Method of making an epoxy prepolymer curing agent. 4,534,882, Cl. 252-182.000.
Binsack, Rudolf; Rempel, Dieter; Lindner, Christian; and Morbitzer, Leo, to Bayer Aktiengesellschaft. Thermoplastic polyester moulding compositions which have good impact strength. 4,535,124, Cl. 525-67.000.
Birmingham Bolt Company: *See—*
White, Claude C.; and Carr, Frederick, 4,534,679, Cl. 405-261.000.
White, Claude C.; and Carr, Frederick, 4,534,680, Cl. 405-261.000.
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Black & Decker Inc.: *See—*
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Somers, Robert I., 4,534,573, Cl. 279-1.00K.
Blackburn, Bobby J.; and Csokmay, John M., to IRD Mechanalysis, Inc. Field balancing apparatus. 4,535,411, Cl. 364-508.000.
Blackston, Michael D.; and Reinecke, Gary, to Heise Manufacturing. Revolving door security system. 4,534,131, Cl. 49-42.000.
Blain, Edward S., to Sundstrand Corporation. Positive displacement scroll apparatus with band linking scrolls. 4,534,718, Cl. 418-55.000.
Blanc, Roger: *See—*
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Bliamptis, Emmanuel E. Evacuated balloon for solar energy collection. 4,534,525, Cl. 244-30.000.
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Russomanno, Charles, 4,534,071, Cl. 4-228.000.
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Blumbach, Jurgen; and Schindler, Peter, to Hoechst Aktiengesellschaft. Chromogenic cephalosporin compound. 4,535,156, Cl. 544-26.000.
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Boden, Richard M.; Temes, Steven D.; Tyszkiewicz, Theodore J.; and Hanna, Marie R., to International Flavors & Fragrances Inc. Branched C_{13}-alk-1-en-5-ones and use thereof in perfumery. 4,534,891, Cl. 252-522.00R.
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McArdle, Francis H., 4,534,704, Cl. 416-158.000.
Boggs, John A.; and Baltz, Robert J. Locking device for garbage can lid. 4,534,488, Cl. 220-323.000.
Bogle, Robert W.; and Gero, Gary. Motion picture camera automatic focusing system. 4,534,629, Cl. 352-140.000.
Bomberger, Howard B.; and Froes, Francis H., to United States of America, Air Force. Method for making alloy additions to base metals having higher melting points. 4,534,938, Cl. 420-590.000.
Bonerb, Timothy C., to Bonerb, Vincent C. Freight vehicle with a convertible cargo space. 4,534,596, Cl. 298-27.000.
Bonerb, Vincent C.: *See—*
Bonerb, Timothy C., 4,534,596, Cl. 298-27.000.
Bonetta, Angelo A.; and Galiotto, Bruno R., to Canadian Ursus Rubber Limited. Apparatus for evaluating foot condition. 4,534,365, Cl. 128-779.000.
Bonko, Mark L.; and Lopp, Loran C., Jr., to Goodyear Tire & Rubber Company, The. Tractor tire. 4,534,392, Cl. 152-209.00B.
Bonner, Francis J., Jr.; and Bonner, Francis J., III, to Universal Medical Products, Inc. Bandage. 4,534,354, Cl. 128-402.000.
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Borish, Jeffrey G.; and Ewy, M. Dale, to Signal Research Laboratory. Audio ambience simulator. 4,535,474, Cl. 381-61.000.

Boston Biomedical Research Institute: *See—*
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Botar, Bela. Vertically installed engine low floor bus. 4,534,442, Cl. 180-294.000.

Bott, John A. Luggage carrier with illuminating means. 4,534,496, Cl. 224-326.000.

Bottcher, Lutz: *See—*
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Bouchard, Claude, to Ronalds-Federated Limited, Rolph-Clark-Stone Packaging Division. Cigarette carton. 4,534,463, Cl. 206-267.000.

Bouche , Michel. Stoppering device for bottles. 4,534,482, Cl. 215-272.000.

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Bourcier, Denis R., to Utah State University Foundation. Atomic absorption spectrophotometric measurement of mercury. 4,534,940, Cl. 422-68.000.

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De Jonckheere, Raphael; and Dussaud, Jacques, 4,534,769, Cl. 604-369.000.

Bowcott, Roy P., to Lucas Industries. Stop/start engine control for a road vehicle. 4,534,326, Cl. 123-179.00B.

Bowen, Terry P.; Caron, Bernard G.; Cooper, Ronald F.; and Glover, Douglas W., to AMP Incorporated. Fiber optic connector having lens. 4,534,616, Cl. 350-96.200.

Bowlsby, David B. Cat toy. 4,534,316, Cl. 119-29.000.

Bowthorpe-Hellermann Limited: *See—*
Louvel, Robin, 4,534,313, Cl. 118-696.000.

Boyle, Gerard H.; Freeman, Roger K.; and Goebel, Franz, to GTE Communications Products Corporation. Structure for electrochemical batteries. 4,535,038, Cl. 429-154.000.

BP Chemicals Limited: *See—*
Cook, John, 4,534,912, Cl. 260-549.000.

BPA Calscan, Inc.: *See—*
Burnham, Robert E., 4,535,244, Cl. 250-372.000.

Bradley, John M. Insulating article and method of making same. 4,535,016, Cl. 428-74.000.

Bradley, Scott M.: *See—*
Weinberg, Robert A.; Tabin, Clifford J.; and Bradley, Scott M., 4,535,058, Cl. 435-6.000.

Bradshaw, William G.: *See—*
Sabota, James J.; and Bradshaw, William G., 4,534,291, Cl. 101-426.000.

Bragin, Boris F.; Kolomiets, Alexandr S.; Korotkikh, Jury B.; Markuntovich, Felix D.; Olofinsky, Evgeny P.; Gladky, Petr V.; Perepletchikov, Evgeny F.; and Ekber, Boris Y., to Voroshilovgradsky Mashinostroitelny Institut. Gate valve. 4,534,540, Cl. 251-203.000.

Brandenstein, Manfred: *See—*
Hans, Rudiger; Brandenstein, Manfred; Friedrich, Wolfgang; and Haas, Roland, 4,534,749, Cl. 474-174.000.

Brandes, Wilhelm: *See—*
Preuss, Reinhard; Perrey, Hermann; Ritter, Helmut; Reinecke, Paul; and Brandes, Wilhelm, 4,535,074, Cl. 514-93.000.

Brandt, Cornelis G., to U.S. Philips Corporation. X-Ray analysis apparatus having an adjustable stray radiation slit. 4,535,469, Cl. 378-081.000.

Brantly, Newby O. Pump jack. 4,534,168, Cl. 60-369.000.

Brasser, Jan: *See—*
Koene, Casper H.; Vos, Cornelis; and Brasser, Jan, 4,534,983, Cl. 426-293.000.

Brauer, Melvin; and Simone, Dominic, to CasChem, Inc. High solids coatings based on diricinoleate derivatives. 4,535,142, Cl. 528-75.000.

Brauer, Wolfgang; Korte, Siegfried; Neukam, Theo; and Suling, Carlhans, to Bayer Aktiengesellschaft. Polymers containing sulphonyl and carboxylic ester groups. 4,535,139, Cl. 526-287.000.

Brault, Robert G.; and Miller, Leroy J., to Hughes Aircraft Company. Wet process for developing styrene polymer resists for submicron lithography. 4,535,054, Cl. 430-325.000.

Braun, Gunter: *See—*
Naunapper, Dietmar; and Braun, Gunter, 4,535,006, Cl. 427-213.000.

Bray, Thomas J.: *See—*
Jindrick, James A.; Dolnik, Thomas G.; Nohria, Naresh K.; Gilker, Clyde; Hurley, James R.; Dunk, Michael P.; Reis, Norbert J.; and Bray, Thomas J., 4,535,409, Cl. 364-481.000.

Brenner, Stanley: *See—*
Johnson, George E.; and Brenner, Stanley, 4,535,398, Cl. 362-404.000.

Bresin, Mark S.: *See—*
Macin, Bruce J.; and Bresin, Mark S., 4,534,208, Cl. 73-49.300.

Breslow, Jeffrey D.: *See—*
Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., 4,534,566, Cl. 273-248.000.
Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., 4,534,567, Cl. 273-255.000.

Bresson, Clarence R.: *See—*
Parlman, Robert M.; and Bresson, Clarence R., 4,534,857, Cl. 209-166.000.

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Wu, Lung-chi; and Bretzloff, Carl W., 4,534,781, Cl. 71-5.000.

Breuer, Hermann: *See—*
Treuner, Uwe D.; and Breuer, Hermann, 4,534,896, Cl. 260-239.00A.

Briard, Rene: *See—*
Allard, Jean-Claude; Briard, Rene; and Saunier, Christian, 4,534,735, Cl. 434-20.000.

Bricot, Claude; Gerard, Jean Louis; and Audoin, Michel, to Thomson-CSF. Optical track follower device with sampling. 4,535,431, Cl. 369-44.000.

Bridgestone Tire Co., Ltd.: *See—*
Ogawa, Masaki; and Shiomura, Yasuro, 4,535,003, Cl. 427-207.100.

Brieu, Francois M. P., to Chlq Frote et Cie. Variable profile roller particularly for the paper making industry. 4,535,230, Cl. 219-470.000.

Brighton, Andrew P., to Ball Corporation. Method and apparatus for remote measurement of a particulate matter on a moving sheet. 4,535,239, Cl. 250-339.000.

Briley, Bruce E.; and Hiltner, Jeffrey A., to AT&T Bell Laboratories. Low power wideband switching array element. 4,535,360, Cl. 358-181.000.

Brisson, Alfred G.: *See—*
Nowacki, Christopher; and Brisson, Alfred G., 4,534,343, Cl. 128-200.230.

British Aerospace Public Limited Company: *See—*
Stephen, David; Mansbridge, Martin H.; and Highnam, Alan W., 4,534,503, Cl. 228-157.000.

British Telecommunications: *See—*
Mountain, Peter J., 4,535,446, Cl. 370-68.000.

Britton, Kennith L.: *See—*
Tittes, Allan F.; Larson, Kenneth H.; and Britton, Kennith L., 4,534,571, Cl. 277-128.000.

Broady, Floyd J.; and Jasek, J. Rondal, to Union Carbide Corporation. Molded-to-size silver-graphite articles and process for making same. 4,534,887, Cl. 252-503.000.

Brockelbank, David M. Variable power transmission for converting reciprocating motion to rotary motion. 4,534,242, Cl. 74-600.000.

Brodkin, Jury M.: *See—*
Rabinovich, Lev M.; Jurovsky, Albert Y.; Brodkin, Jury M.; Puginsky, Viktor A.; Iordan, Georgy G.; Serdjukov, Vilen I.; Sukhodolets, Vadim K.; Tikhnova, Galina V.; and Golikova, Galina M., 4,535,283, Cl. 323-365.000.

Brodzik, Bruce F.: *See—*
Kreusch, Edward G.; and Brodzik, Bruce F., 4,534,867, Cl. 210-722.000.

Brooks, Edward D., to Horton Manufacturing Co., Inc. Combination clutch-brake. 4,534,454, Cl. 192-18.00A.

Brotz, Gregory R. High-temperature carbon fiber coil and method for producing same. 4,534,997, Cl. 427-53.100.

Brovman, Yakov Z., to Harris Graphics Corporation. Method and apparatus for registering overlapping printed images. 4,534,288, Cl. 101-211.000.

Brown, Allan H. G. Elongated prop for supporting a load. 4,534,531, Cl. 248-351.000.

Brown, Barry J.: *See—*
Jahnke, William R.; Rockel, Bruce H.; Brown, Barry J.; Hawley, Floyd E.; Pennella, Andrew J.; Sugrue, John C.; and Wiggins, William R., 4,534,093, Cl. 29-26.00A.

Brown, Claude D., to BBC Industries, Inc. Cooling system. 4,534,181, Cl. 62-180.000.

Brown, David L.: *See—*
Garcia, Frank, Jr.; and Brown, David L., 4,534,096, Cl. 29-157.10R.

Brown, Gregory C., to Rosemount, Inc. Electric signal to pressure signal transducer. 4,534,376, Cl. 137-83.000.

Brown, Lewis R.; and Brown-Skrobot, Susan, to Chevron Research Company. Controlling plant fungi using streptomycetes grown on chitin. 4,534,965, Cl. 424-93.000.

Brown, Sanford S.: *See—*
Baxter, Leslie A.; and Brown, Sanford S., 4,535,448, Cl. 370-85.000.

Brown-Skrobot, Susan: *See—*
Brown, Lewis R.; and Brown-Skrobot, Susan, 4,534,965, Cl. 424-93.000.

Brown, Vincent B.; and Schreiner, Donald G., to Methode Electronics, Inc. Apparatus for applying assembled connector terminals and the like to a plurality of leads. 4,534,098, Cl. 29-564.800.

Brown, Vincent B.; and Geib, Lawrence, to Methode Electronics, Inc. Assembly of a contact spring and wire wrap terminal. 4,534,603, Cl. 339-17.00C.

Browne, Gwendolen, to DeBlauwe Lier B.V. Method for washing of textiles in hard water and phosphate-free detergent compositions for use therein. 4,534,876, Cl. 252-90.000.

Browning, Jhonce N.: *See—*
Hopkins, Quentin G.; and Browning, Jhonce N., 4,534,945, Cl. 423-273.000.

Brownlee, Michael: *See—*
Cerami, Anthony; Pongor, Sandor; and Brownlee, Michael, 4,534,894, Cl. 260-112.700.
Bruggendieck, Siegfried, to U.S. Philips Corporation. Optical communication cable. 4,534,618, Cl. 350-96.230.
Bruker Medizintechnik GmbH: *See—*
Post, Hans; and Ratzel, Dieter, 4,535,290, Cl. 324-309.000.
Bruner, Jeffrey W.; Davis; Delbert A.; and Leach, Jack, to Burlington Industries, Inc. Weft inserted warp knit construction. 4,535,015, Cl. 428-44.000.
Brunninger, Manfred: *See—*
Theurer, Josef; and Brunninger, Manfred, 4,534,415, Cl. 171-16.000.
Brunswick Corporation: *See—*
Slattery, Gordon C., 4,534,333, Cl. 123-545.000.
Slattery, Gordon C., 4,534,739, Cl. 440-84.000.
Buchmuller, Horst; and Michelbrink, Bernhard, to Deutsche Babcock Werke Aktiengesellschaft. Wet ash removal equipment. 4,534,299, Cl. 110-165.00R.
Buck, David J. Garden row marker. 4,534,125, Cl. 40-10.00C.
Buckley, John J.; and Scott, William T., to United States of America, Air Force. Modular air shut-off valve. 4,534,538, Cl. 251-62.000.
Buczkowski, Gary J.; and Fresia, E. James, to Sprague Electric Company. Electrolytic capacitor. 4,535,389, Cl. 361-433.000.
Budd Company, The: *See—*
Iseler, Kenneth A.; Guha, Probir K.; and Yen, Robert C., 4,535,110, Cl. 524-196.000.
Budzich, Mieczlyslaw; and Fitz, Forest G., Jr., to AT&T Nassau Metals Corporation. Cable stripping apparatus. 4,534,254, Cl. 83-425.200.
Budzich, Tadeusz. Water-oil separating system for use with centrifugal type separator. 4,534,860, Cl. 210-137.000.
Buehler Ltd.: *See—*
Nelson, James A.; and Zimmer, Robert E., 4,534,536, Cl. 249-83.000.
Bugay, Frederick: *See—*
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Bung, Richard; Gans, Karl; Schreyer, Gerold; and Welzel, Gerhard, to BASF Aktiengesellschaft. Apparatus for the preparation of bonding fibers from polymer dispersions. 4,534,720, Cl. 425-7.000.
Bura, Paul, to Northern Telecom Limited. High frequency amplifier with phase compensation. 4,535,304, Cl. 330-300.000.
Burbank, Charles H.; and Lewis, Robert J., to Raymond Corporation, The. Material handling vehicle. 4,534,433, Cl. 180-19.100.
Burbank, Edward W., Jr. Wireline tension gage. 4,534,228, Cl. 73-862.450.
Burchfield, William L.; Carr, Edward L.; and Laskowski, Gordon J., to United States of America, Navy. Bridge crane. 4,534,476, Cl. 212-190.000.
Burda, Josef: *See—*
von Laar, Klaus; Heberlein, Werner; and Burda, Josef, 4,534,294, Cl. 102-520.000.
Burge, Donald G., to Parker-Hannifin Corporation. Locking frame for valves. 4,534,379, Cl. 137-385.000.
Burkert GmbH: *See—*
Dettmann, Heinrich, 4,534,539, Cl. 251-65.000.
Burlington Industries, Inc.: *See—*
Bruner, Jeffrey W.; Davis, Delbert A.; and Leach, Jack, 4,535,015, Cl. 428-44.000.
Burmeister, Gerhard: *See—*
Behre, Horst; Blank, Heinz U.; Burmeister, Gerhard; and Lindner, Otto, 4,534,905, Cl. 260-505.00C.
Burnand, Richard P.: *See—*
Phaal, Cornelius; Pipkin, Noel J.; and Burnand, Richard P., 4,534,773, Cl. 51-293.000.
Burnham, Robert E., to BPA Calscan, Inc. Photodosimeter. 4,535,244, Cl. 250-372.000.
Burrell, Leo L. String musical instrument. 4,534,260, Cl. 84-293.000.
Burroughs Corporation: *See—*
Kuznetzoff, Philip, 4,534,744, Cl. 445-47.000.
Burroughs Wellcome Co.: *See—*
Kneen, Geoffrey, 4,535,183, Cl. 514-568.000.
Bury, John E., to Grafton Limited. Drive mechanisms for inked ribbon cassettes. 4,534,667, Cl. 400-207.000.
Bush, Thomas J.; Dellinger, Charles L.; and Fregeolle, Gerald P., to Hunt Manufacturing Co. Scissors. 4,534,109, Cl. 30-260.000.
Bussiere, Jean F.: *See—*
Nadeau, Francois; Bussiere, Jean F.; and Vaudreuil, Ghislain, 4,534,219, Cl. 73-587.000.
Butler, David O. Unitary cable closure. 4,535,197, Cl. 174-41.000.
Butler, Ernest P.: *See—*
Field, David J.; Butler, Ernest P.; and Bassett, Katherine-Ann, 4,534,807, Cl. 148-20.300.
Buzzard, Clair A.; and Mina, Kent V., to AT&T Information Systems Inc. Multifrequency tone distribution using a conferencing arrangement. 4,535,454, Cl. 370-110.200.
BWG Bergwerk - und Walzwerk-Maschinenbau GmbH: *See—*
Noe, Oskar; Noe, Andreas; and Noe, Rolf, 4,534,198, Cl. 72-201.000.
Byk Gulden Lomberg Chemische Fabrik GmbH: *See—*
Terry, Erwin N., 4,535,082, Cl. 514-264.000.
C. Conradty Nurnberg GmbH & Co., KG: *See—*
Zollner, Dieter H.; Zollner, Christine; Schieber, Franz; Lauterbach-Dammler, Inge; and Koziol, Konrad, 4,534,836, Cl. 204-67.000.
Cabus, Marcello M.; Howard, Billy D.; Colt, James W.; and Tuft, Edward S., to Sun-Flo International, Inc. Solar-assisted mobile food dehydrator. 4,534,118, Cl. 34-34.000.
Cachat, John F.: *See—*
Sheetz, Richard S.; and Cachat, John F., 4,535,212, Cl. 219-10.770.
Cadars, Patrick, to Societe Anonyme Francaise Du Ferodo. Tubular heat exchanger and helical agitators for use with such exchangers. 4,534,409, Cl. 165-109.00T.
Cade, Paul E., to International Business Machines Corporation. Laser process for forming identically positioned alignment marks on the opposite sides of a semiconductor wafer. 4,534,804, Cl. 148-1.500.
Calgene, Inc.: *See—*
Comai, Luca, 4,535,060, Cl. 435-172.300.
California Institute of Technology: *See—*
Rembaum, Alan; and Yen, Richard C. K., 4,534,996, Cl. 427-44.000.
California R&D Center: *See—*
Jones, Lawrence T.; Lee, Robert S.; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., 4,534,745, Cl. 446-398.000.
Callicott, Robert H.: *See—*
Iding, Stephen H.; and Callicott, Robert H., 4,534,879, Cl. 252-174.000.
Calvert, Colin; and Cox-Smith, Peter, to Hoccum Developments Limited. Centrifuges. 4,534,755, Cl. 494-37.000.
Camco, Incorporated: *See—*
Pringle, Ronald E., 4,534,414, Cl. 166-317.000.
Camp International, Inc.: *See—*
Bart, Gordon B.; Hiemstra, Carol L.; and Tyo, James H., 4,534,341, Cl. 128-75.000.
Campbell Soup Company: *See—*
Wu, Lung-chi; and Bretzloff, Carl W., 4,534,781, Cl. 71-5.000.
Canadian Patents & Development Limited: *See—*
van Eyken, Lawrence A. J.; and Perlin, Semion, 4,534,527, Cl. 246-445.000.
Canadian Ursus Rubber Limited: *See—*
Bonetta, Angelo A.; and Galiotto, Bruno R., 4,534,365, Cl. 128-779.000.
Canet, Roland; Delhaes, Pierre; Dupart, Eliane; Pacault, Adolphe; Pascal, Claude; and Manceau, Jean-Pierre, to Commissariat a l'Energie Atomique. Piezoresistive gauge formed by an electrically conductive organic compound. 4,535,317, Cl. 338-36.000.
Cangialosi, Arthur D., to United States of America, Navy. Gyro sensor block suspension. 4,534,648, Cl. 356-350.000.
Cannady, John P., to Dow Corning Corporation. Silicon nitride-containing ceramics. 4,535,007, Cl. 427-226.000.
Canon Kabushiki Kaisha: *See—*
Hirohata, Michio; and Ikari, Hideo, 4,534,638, Cl. 354-418.000.
Inoue, Sukejiro; Sasakawa, Masumi; Fukumoto, Hiroshi; and Doi, Shinji, 4,535,048, Cl. 430-110.000.
Ishikawa, Shozo; Toma, Hitoshi; and Sumino, Fumio, 4,535,043, Cl. 430-58.000.
Ito, Tadashi; Isobe, Yasuo; Ito, Fumio; and Nakamoto, Soichi, 4,534,640, Cl. 354-448.000.
Kano, Kuniomi; Fushimoto, Hideo; Sekine, Kazumi; Miyagawa, Akira; Hirata, Osamu; and Nishimuro, Yoshiaki, 4,535,416, Cl. 364-715.000.
Konishi, Yuichiro; Tsunekawa, Tokuichi; and Someya, Hiromi, 4,534,639, Cl. 354-432.000.
Noda, Atsushi, 4,535,344, Cl. 346-139.00D.
Ohara, Tsunemasa; Suzuki, Masayuki; and Yamamichi, Masayoshi, 4,534,633, Cl. 354-237.000.
Suzuki, Takashi; Matsumura, Susumu; and Ohtaka, Keiji, 4,534,637, Cl. 354-403.000.
Toda, Katuhiko; and Sugiura, Susumu, 4,534,624, Cl. 350-429.000.
Cape Cod Research: *See—*
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Capriotti, Luigi: *See—*
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Cardiff, Raymond S. Air directing apparatus. 4,534,279, Cl. 98-40.180.
Carey, Richard A.; and Falk, Jerry, to Honeywell Information Systems, Inc. Bus arbitration logic. 4,535,330, Cl. 340-825.500.
Carlin, James W., to AT&T Bell Laboratories. Offset geometry, interference canceling receiver. 4,535,476, Cl. 455-63.000.
Carlin, John A.: *See—*
Bigelow, Stephen L.; and Carlin, John A., 4,534,557, Cl. 273-55.00A.
Carlson, Ronald F., to General Dynamics Corporation/Convair Div. Hand airfeed powertool. 4,534,682, Cl. 408-14.000.
Carlstrom, Elis; Johnsson, Agneta I.; and Hermansson, Leif A. G. Method for removal of organic binding agents from molded bodies. 4,534,936, Cl. 419-36.000.
Caron, Bernard G.: *See—*
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Carosino, Paul J. Shift controller. 4,534,237, Cl. 74-476.000.
Carr, Edward L.: *See—*
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Carr, Frederick: *See—*
White, Claude C.; and Carr, Frederick, 4,534,679, Cl. 405-261.000.
White, Claude C.; and Carr, Frederick, 4,534,680, Cl. 405-261.000.
Carr, Peter; and Rowan, John W., to Energy Development Associates, Inc. Zinc-chloride battery in a chlorine producing/consuming plant. 4,534,833, Cl. 204-128.000.
Carre , Christian; and Guibet, Jean P., to Air Industrie. Installation for injecting a powdery material, particularly an adsorbent material, into a contact column. 4,534,778, Cl. 55-340.000.
Carroll, William F., to Secton Pty. Ltd. Folding door. 4,534,395, Cl. 160-199.000.

Carter, Michael J., to Tocco, Inc. Inductor and method of making same. 4,535,211, Cl. 219-10.49R.
Carter-Wallace, Inc.: *See—*
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Kim, Miwon S., 4,534,974, Cl. 514-161.000.
CasChem, Inc.: *See—*
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Casino Technology: *See—*
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Casio Computer Co., Ltd.: *See—*
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Cassella Aktiengesellschaft: *See—*
Dorries, Peter; Gotze, Thomas; Piesch, Steffen; Schon, Manfred; Wulff, Gunther; Hintermeier, Karl; Wulff, Gunther; and Hintermeier, Karl, 4,535,031, Cl. 428-481.000.
Cassidenti, Michael L., to Rockwell International Corporation. Metalworking tool using electrical heating. 4,535,216, Cl. 219-68.000.
Castaldi, Graziano; and Giordano, Claudio, to Zambon S.p.A. Process for preparing alpha-arylalkanoic acids. 4,535,166, Cl. 548-204.000.
Castleman, Bruce W.; McQuire, David P.; and Szonntagh, Eugene L., to Honeywell Inc. Gas separation apparatus. 4,534,777, Cl. 55-181.000.
Caterpillar Tractor Co.: *See—*
Grawey, Charles E., 4,534,394, Cl. 152-396.000.
Mitchell, Randall M., 4,534,707, Cl. 417-34.000.
Cattani, Alberto, to COMAU S.p.A. Device for locating and locking a work holding pallet on a machine tool fixture. 4,534,546, Cl. 269-58.000.
Caus, Frans, to Tate & Lyle Public Limited Company. Measuring the draft of a vessel. 4,534,217, Cl. 73-178.00R.
Cazinha, John R.: *See—*
Wilger, John F.; Nakano, Gregory S.; Orillo, Stephen, Jr.; and Cazinha, John R., 4,534,135, Cl. 51-241.00S.
Cederquist, Alf L., to Ford Motor Company. Drivetrain torque determination using torque converter characteristics. 4,535,412, Cl. 364-511.000.
Cedrone, Nicholas J.; and Lee, Kenneth R., to Daymarc Corporation. Symmetrical, single point drive for contacts of an integrated circuit tester. 4,534,605, Cl. 339-75.00M.
Cegedur Societe de Transformation de L'Aluminium Pechiney: *See—*
Meunier, Jean; and Salesse, Marc, 4,534,937, Cl. 419-42.000.
Cegielski, John M., Jr.: *See—*
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Celanese Corporation: *See—*
Choe, Eui W.; and Conciatori, Anthony B., 4,535,144, Cl. 528-207.000.
Hsieh, Jih-Han; Barer, Sol J.; and Maxwell, Peter C., 4,535,059, Cl. 435-142.000.
Hunter, Joe M., 4,535,150, Cl. 528-489.000.
McAliley, J. Eugene; Daumit, Gene P.; and Ethridge, Fredrick A., 4,534,919, Cl. 264-29.200.
Celette, Germain, to Celette S.A. Apparatus for mounting an automobile body on a checking frame. 4,534,200, Cl. 72-305.000.
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Cemin, Hans, to Societe d'Etudes et Installations Industrielles CNUD S.A. Apparatus for heat treatment of objects by convection. 4,534,780, Cl. 65-348.000.
Centre de Recherche Industrielle du Quebec: *See—*
Barbulescu, Adrian; Boulet, Rodrique; and Lessard, Denis, 4,534,868, Cl. 210-780.000.
Centre National de la Recherche Scientifique (CNRS): *See—*
Arnal, Yves; Pelletier, Jacques; and Pomot, Claude, 4,534,842, Cl. 204-192.00E.
Cerami, Anthony; Pongor, Sandor; and Brownlee, Michael, to Rockefeller University, The. Process for sulphation and phosphorylation of proteins and peptides. 4,534,894, Cl. 260-112.700.
Ceskoslovenska: *See—*
Wichterle, Otto, 4,534,916, Cl. 264-2.100.
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Chamberlain Manufacturing Corporation: *See—*
Twardowski, Joseph W., 4,535,333, Cl. 340-825.690.
Champigny, Lucien. Foldable ladder scaffold. 4,534,447, Cl. 182-152.000.
Champion International Corporation: *See—*
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Chan, C. S.: *See—*
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Chan, Wan-Kit: *See—*
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Chang, Wen-Hsuan: *See—*
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Chapin, Richard D. Drip irrigation system employing adjacently arranged flow-restricting passages. 4,534,515, Cl. 239-542.000.
Charbonnages de France: *See—*
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Charles, Douglas K.: *See—*
Ambrose, John; Charles, Douglas K.; Conard, Bruce R.; Diaz, Carlos; O'Neill, Charles E.; and Leavoy, Wayne P., 4,534,935, Cl. 419-23.000.
Chavkin, Leonard, to Warren Glen Products, Inc. Mentholated oral composition. 4,534,960, Cl. 424-49.000.
Chee, Wan T., to Boeing Company, The. Inlet cowl attachment for jet engine. 4,534,167, Cl. 60-226.100.
Chemap AG: *See—*
Muller, Hans, 4,535,062, Cl. 435-289.000.
Chen, Lee; Hendricks, Charles J.; Mathad, Gangadhara S.; and Poloncic, Stanley J., to International Business Machines Corporation. Single wafer plasma etch reactor. 4,534,816, Cl. 156-345.000.
Chen, Pau-Ling, to Advanced Micro Devices, Inc. Process for forming isolation slots having immunity to surface inversion. 4,534,824, Cl. 156-628.000.
Chesebrough-Pond's Inc.: *See—*
Gordon, Philip J., 4,534,963, Cl. 424-69.000.
Chevron Research Company: *See—*
Brown, Lewis R.; and Brown-Skrobot, Susan, 4,534,965, Cl. 424-93.000.
Loh, William, 4,534,785, Cl. 71-88.000.
Luo, Tatao; Russo, Louis; and Freenor, Francis J., III, 4,534,786, Cl. 71-88.000.
Rosenbaum, John M., 4,534,955, Cl. 423-573.00R.
Spatz, David M., 4,535,087, Cl. 514-352.000.
Chew, Nigel G.: *See—*
Cullis, Anthony G.; Webber, Hugh C.; and Chew, Nigel G., 4,535,220, Cl. 219-121.0LM.
Chiba, Tadatoshi: *See—*
Sanada, Yuzo; Yokoyama, Susumu; Chiba, Tadatoshi; Yokono, Tetsuro; Moritomi, Hiroshi; Obara, Toshiyuki; and Nagaishi, Hiroshi, 4,534,848, Cl. 208-10.000.
Chinoin, Gyogyszer Es Vegyeszeti Termekek Gyara Rt.: *See—*
Szejtli, Jozsef; Fenyvesi, Eva; Zsadon, Bela; Szilasi, Maria; and Decsei, Lajos, 4,535,152, Cl. 536-103.000.
Chisso Corporation: *See—*
Shimizu, Hiroshi; Abe, Masaki; and Sato, Akihiro, 4,535,069, Cl. 502-115.000.
Sugimori, Shigeru; Kojima, Tetsuhiko; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,534,883, Cl. 252-299.630.
Chlq Frote et Cie: *See—*
Brieu, Francois M. P., 4,535,230, Cl. 219-470.000.
Cho, Alfred Y.; Glance, Bernard; Lubzens, Daniel; and Schneider, Martin V., to AT&T Bell Laboratories. Method of making self-aligned metal gate field effect transistors. 4,534,103, Cl. 29-571.000.
Cho, Hyun S., to General Electric Company. Axial sweep-through process for preparing diamond wire die compacts. 4,534,934, Cl. 419-6.000.
Choe, Eui W.; and Conciatori, Anthony B., to Celanese Corporation. Synthesis of high molecular weight polybenzimidazole with arylhalo phosphorus compound catalyst. 4,535,144, Cl. 528-207.000.
Chow, Ho; and Goodman, Sidney J., to Melnor Industries, Inc. Fluid dispenser. 4,534,512, Cl. 239-394.000.
Christensen, Burton G.: *See—*
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Wakazawa, Tadashi; Niida, Taro; and Christensen, Burton G., 4,534,898, Cl. 260-245.300.
Christian, James E., III. Hub for geodesic dome construction. 4,534,672, Cl. 403-172.000.
Christian Miesen Fahrzeug-Und Karosseriewerk GmbH: *See—*
Schnitzler, Alois, 4,534,075, Cl. 5-82.00R.
Churyo Engineering Co., Ltd.: *See—*
Watabe, Shin; and Shibata, Hideto, 4,534,410, Cl. 165-126.000.
Ciba-Geigy Corporation: *See—*
Moser, Hans, 4,534,904, Cl. 260-502.50F.
Steinberg, David H.; Seltzer, Raymond; Luzzi, John J.; and Cortolano, Frank P., 4,534,874, Cl. 252-51.50A.
Troxler, Eduard; Kainmuller, Thomas; and Maul, Rudolf, 4,535,145, Cl. 528-289.000.
Cincinnati Electronics Corporation: *See—*
Stepp, Elvin D.; and Claypoole, Gary L., 4,535,461, Cl. 375-110.000.
Ciupak, Leonard A.: *See—*
Johnston, Gary M.; and Ciupak, Leonard A., 4,534,635, Cl. 354-322.000.
CKD Controls Limited: *See—*
Tsukamoto, Kou; and Hirate, Masatoshi, 4,535,261, Cl. 310-78.000.
Clark, Gary G. Automotive friction reducing composition. 4,534,873, Cl. 252-32.70E.
Claudepierre, Christian: *See—*
Ravinet, Pierre; Claudepierre, Christian; Guillou, Denis; and Micheron, Francois, 4,535,205, Cl. 179-110.00A.
Claypoole, Gary L.: *See—*
Stepp, Elvin D.; and Claypoole, Gary L., 4,535,461, Cl. 375-110.000.
Clayson, Arthur E.: *See—*
Bates, Jack; and Clayson, Arthur E., 4,534,265, Cl. 89-14.600.
Clayton, John P., to Beecham Group Limited. Pharmaceutical compositions. 4,534,908, Cl. 424-114.000.
Cleary, Michael T., to UOP Inc. Process for separating fatty acids from unsaponifiables. 4,534,900, Cl. 260-428.500.
Clement, Maurice C., to Crepaco, Inc. Blending and emulsifying apparatus. 4,534,657, Cl. 366-265.000.
Clerget, Michel; Germain, Francois; Kryze, Jiri; and Poujois, Robert, to INRIA Institut National de Recherche en Informatique et en Au-

tomatique. Device for the determination of the position of points on the surface of a body. 4,534,650, Cl. 356-376.000.

Clifford, Albert F. Apparatus for applying chemicals to textiles. 4,534,189, Cl. 68-5.00D.

Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, to General Tire & Rubber Company, The. In-mold coating. 4,534,888, Cl. 252-511.000.

Cochrane, Douglas A., Jr.; and Styer, Fred W., to Cochrane Subsea Acoustics, Inc. Subsea acoustic relocation system. 4,535,430, Cl. 367-133.000.

Cochrane Subsea Acoustics, Inc.: *See*—
Cochrane, Douglas A., Jr.; and Styer, Fred W., 4,535,430, Cl. 367-133.000.

Coe, Jotham W.: *See*—
Meltzer, Peter C.; and Coe, Jotham W., 4,535,157, Cl. 546-44.000.

Coffman, Allen B.: *See*—
Grove, John L.; Hockensmith, John L.; and Coffman, Allen B., 4,534,575, Cl. 280-6.110.

Cogdill, Ben. Educational toy. 4,534,736, Cl. 434-403.000.

Colby, Lewis J., Jr., to Allied Corporation. Ferromagnetic amorphous metal carrier particles for electrophotographic toners. 4,535,047, Cl. 430-108.000.

Cole, Charles A.: *See*—
Pocock, John F. E.; Cole, Charles A.; Villanueva, James G.; Matlack, John D.; and Lewis, Shelton E., 4,534,995, Cl. 427-38.000.

Coleman Company, Inc., The: *See*—
Curtis, Richard D.; and Conley, James R., 4,535,390, Cl. 362-179.000.
Zwick, David J., 4,534,601, Cl. 312-266.000.

Colgate-Palmolive Company: *See*—
Marschner, Frank W., 4,534,962, Cl. 424-65.000.

Colliau, Joel D., to Ace Controls, Inc. Reciprocating drill feed control rod holding means. 4,534,683, Cl. 408-17.000.

Collins, Guy R., to Dow Chemical Company, The. Process for the preparation of substituted amino dienes. 4,534,903, Cl. 260-465.50R.

Collins, Ian P.; and Fernie, Douglas P., to Warner-Lambert Technologies, Inc. Endoscope. 4,534,339, Cl. 128-6.000.

Colt, James W.: *See*—
Cabus, Marcello M.; Howard, Billy D.; Colt, James W.; and Tuft, Edward S., 4,534,118, Cl. 34-34.000.

Columbia University in the City of New York, The Trustees of: *See*—
Fox, Charles L., Jr.; and Modak, Shanta M., 4,535,078, Cl. 514-157.000.

Comai, Luca, to Calgene, Inc. Inhibition resistant 5-enolpyruvyl-3-phosphoshikimate synthetase, production and use. 4,535,060, Cl. 435-172.300.

COMAU S.p.A.: *See*—
Cattani, Alberto, 4,534,546, Cl. 269-58.000.

Combustion Engineering, Inc.: *See*—
Milberger, Lionel J.; Martin, Jimmy R.; and Mataway, Thomas P., 4,534,583, Cl. 285-24.000.

Comfort, Gloria N. Blanket garment wrap. 4,534,065, Cl. 2-69.500.

Commissariat a l'Energie Atomique: *See*—
Canet, Roland; Delhaes, Pierre; Dupart, Eliane; Pacault, Adolphe; Pascal, Claude; and Manceau, Jean-Pierre, 4,535,317, Cl. 338-36.000.
Jouve, Hubert; and Magnin, Joel, 4,535,422, Cl. 365-36.000.

Compagnie Generale de Constructions Telephoniques: *See*—
Meunier, Bernard, 4,535,202, Cl. 179-18.0FA.

Compagnie Generale de Geophysique: *See*—
Rocroi, Jean-Pierre C.; and Gole, Francois V., 4,535,293, Cl. 324-336.000.

Compagnie Industrielle De Mecanismes en abrege C.I.M.: *See*—
Parizet, Roger, 4,534,532, Cl. 248-371.000.

Conard, Bruce R.: *See*—
Ambrose, John; Charles, Douglas K.; Conard, Bruce R.; Diaz, Carlos; O'Neill, Charles E.; and Leavoy, Wayne P., 4,534,935, Cl. 419-23.000.

Conciatori, Anthony B.: *See*—
Choe, Eui W.; and Conciatori, Anthony B., 4,535,144, Cl. 528-207.000.

Concord Tool and Machine Company: *See*—
Ng, Min-Hing, 4,534,474, Cl. 211-70.000.

Conley, James R.: *See*—
Curtis, Richard D.; and Conley, James R., 4,535,390, Cl. 362-179.000.

Connecticut Artcraft Corp.: *See*—
Viesturs, Eric A.; and Viesturs, Gundar E., 4,534,078, Cl. 5-452.000.

Conoco Inc.: *See*—
Reichl, Eric H., 4,534,772, Cl. 44-53.000.

Conway, Joseph A.; and Meier, Douglas R., to Universal Skate Sharpeners Ltd. Ice skate sharpening machine. 4,534,134, Cl. 51-96.000.

Consolidated Papers, Inc.: *See*—
Damrau, Wayne A.; Vreeland, William C.; Bernert, Richard; and Wohrle, Albert, 4,534,309, Cl. 118-410.000.

Consonni, Pietro: *See*—
Galliani, Giulio; Omodei-Sale, Amedeo; Consonni, Pietro; and Assandri, Alessandro, 4,535,090, Cl. 514-383.000.

Constance-Hughes, Trevor, to Siebe Gorman & Company Limited. Breathing apparatus and facemasks therefor. 4,534,344, Cl. 128-201.150.

Container Corporation of America: *See*—
Montealegre, James W., 4,534,505, Cl. 229-33.000.

Conti, Vincent N., to American Safety Closure Corp. Tamper evident container closure. 4,534,479, Cl. 215-252.000.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Fischer, Rolf; and Hermann, Dietmar, 4,534,724, Cl. 425-295.000.

Continental Pharma, Inc.: *See*—
Franz, Michel R.; Vincze, Andreas B.; Lambelin, Georges E.; and Polat, Alain V., 4,534,911, Cl. 514-575.000.

Contraves AG: *See*—
Hanseler, Urs; Meier, Urs; and Muther, Franz, 4,534,472, Cl. 211-41.000.

Cook, John, to BP Chemicals Limited. Preparation of anhydrides. 4,534,912, Cl. 260-549.000.

Cooper, Ronald F.: *See*—
Bowen, Terry P.; Caron, Bernard G.; Cooper, Ronald F.; and Glover, Douglas W., 4,534,616, Cl. 350-96.200.

Corbel, Jean Yves, to LGT, Laboratoire General des Telecommunications. Equipment for the retransmission of television signals in a common channel, with an automatic control of the video/audio ratio. 4,535,361, Cl. 358-184.000.

Cordis Corporation: *See*—
Gold, Philip, 4,534,363, Cl. 128-772.000.

Cordis Europa, N.V.: *See*—
Koning, Gerrit; and Bergveld, Piet, 4,534,825, Cl. 156-644.000.

Corning Glass Works: *See*—
DeAngelis, Thomas P., 4,534,835, Cl. 204-67.000.

Coronado, Hector M. Laminated wood coupling arrangement. 4,535,019, Cl. 428-106.000.

Cortolano, Frank P.: *See*—
Steinberg, David H.; Seltzer, Raymond; Luzzi, John J.; and Cortolano, Frank P., 4,534,874, Cl. 252-51.50A.

Cosden Technology, Inc.: *See*—
Fortuna, Vincent; and MacLaughlin, Donald, 4,534,751, Cl. 493-108.000.

Cosenza, Frank J., to Rexnord Inc. Fastener of the hold-down type. 4,534,234, Cl. 74-89.150.

Cosme, Peter A. Drawer slide assembly. 4,534,600, Cl. 308-3.600.

Coue, Maurice E. L., to Huret et ses Fils. Lever and collar unit in particular for a cycle. 4,534,238, Cl. 74-489.000.

Coulter Electronics, Inc.: *See*—
Groves, Michael R.; and Rodriguez, Carlos M., 4,535,284, Cl. 324-71.100.
Rothermel, William F.; Matthews, John P.; Walker, James W.; and Coulter, Wallace H., 4,534,465, Cl. 206-443.000.

Coulter, Wallace H.: *See*—
Rothermel, William F.; Matthews, John P.; Walker, James W.; and Coulter, Wallace H., 4,534,465, Cl. 206-443.000.

Courbon, Paul, to Charbonnages de France. Individual portable dust collector. 4,534,230, Cl. 73-863.230.

Courtay, Robert Y., to Fuller Company. Blender for powdery material. 4,534,653, Cl. 366-106.000.

Courtney, David T.: *See*—
McCabe, Bernard J.; and Courtney, David T., 4,534,717, Cl. 418-181.000.

Courty, Philippe; Roussel, Michel; Varin, Philippe; Le Page, Jean-Francois; and Leporq, Serge, to Institut Francais du Petrole. Catalyst containing iron, chromium, potassium and lanthanum oxides, its manufacture and use in dehydrogenation reactions. 4,535,067, Cl. 502-84.000.

Covill, Dennis H., to Nautical Electronics Laboratories Limited. Driver circuit. 4,535,298, Cl. 330-189.000.

Cox, Edward A., to Wilton Corporation. Rapid acting C-clamp. 4,534,547, Cl. 269-182.000.

Cox, Ron; and Pettovello, Elzi. Wire drive mechanism. 4,534,499, Cl. 226-184.000.

Cox-Smith, Peter: *See*—
Calvert, Colin; and Cox-Smith, Peter, 4,534,755, Cl. 494-37.000.

Craig Medical Products Limited: *See*—
Steer, Peter L.; and Edwards, John V., 4,534,766, Cl. 604-323.000.

Crane & Co.: *See*—
Crane, Timothy T., 4,534,398, Cl. 162-103.000.

Crane, Timothy T., to Crane & Co. Security paper. 4,534,398, Cl. 162-103.000.

Cray Research, Inc.: *See*—
August, Melvin C.; and Williams, John T., 4,535,385, Cl. 361-388.000.

Cremers, Norbert J.: *See*—
Adams, Dennis V.; Cremers, Norbert J.; and Henry, Raymond L., 4,534,958, Cl. 424-45.000.

Crepaco, Inc.: *See*—
Clement, Maurice C., 4,534,657, Cl. 366-265.000.

Cristell, Frank A., to Donahue, Robert H. Duct molding and cable mounting clips. 4,534,147, Cl. 52-287.000.

Crivello, James V., to General Electric Company. Free-radical initiators and method for making. 4,535,174, Cl. 556-443.000.

Cros, Pierre, to Promecam Sisson-Lehmann. Adapter device for mounting punches on a bending press. 4,534,203, Cl. 72-481.000.

Crosbie, Richard J.; and Edwards, Paul R., to United States of America, Navy. Servo operated anti-G suit pressurization system. 4,534,338, Cl. 128-1.00A.

Crown Zellerbach Corporation: *See*—
Steen, Conrad, 4,534,399, Cl. 162-212.000.

Csanky, Peter H.: *See*—
Arn, Robert M.; Csanky, Peter H.; and Waszek, Glen F., 4,535,355, Cl. 358-123.000.

Csaszar, Szilveszter: *See*—
Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , 4,534,782, Cl. 71-21.000.

Csokmay, John M.: *See—*
Blackburn, Bobby J.; and Csokmay, John M., 4,535,411, Cl. 364-508.000.

Cuff, Richard A.; and Hoffman, Paul R., to Tyler Griffin Company. Playing card coding system and apparatus for dealing coded cards. 4,534,562, Cl. 273-149.00P.

Cuhel, Leon L., to FMC Corporation. Hydraulic disk brake circuit for crane draw works. 4,534,598, Cl. 303-10.000.

Culligan International Company: *See—*
Kreusch, Edward G.; and Brodzik, Bruce F., 4,534,867, Cl. 210-722.000.

Cullis, Anthony G.; Webber, Hugh C.; and Chew, Nigel G., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Integrated circuits. 4,535,220, Cl. 219-121.0LM.

Currie, Bruce L.: *See—*
Krstenansky, John L.; and Currie, Bruce L., 4,535,169, Cl. 548-453.000.

Curtis, Richard D.; and Conley, James R., to Coleman Company, Inc., The. Folding reflector for a lantern. 4,535,390, Cl. 362-179.000.

Cuscurida, Michael; and Waddill, Harold G., to Texaco Inc. Polyether polyols modified with epoxy resin-diamine adducts. 4,535,133, Cl. 525-504.000.

Cuscurida, Michael, to Texaco Inc. Polyol purification process. 4,535,189, Cl. 568-620.000.

Cutler, Earl F., to Cutler Repaving, Inc. Dual-lift repaving machine. 4,534,674, Cl. 404-75.000.

Cutler Repaving, Inc.: *See—*
Cutler, Earl F., 4,534,674, Cl. 404-75.000.

Dada, Abdul G.: *See—*
Sakash, George; Grier, Robert K., Jr.; Stern, Hansjoerg; Dada, Abdul G.; and McKeel, Daniel W., 4,534,301, Cl. 110-255.000.

Daido Steel Company Limited: *See—*
Matsuoka, Shigeki; and Naitoh, Yoshihiro, 4,534,801, Cl. 134-15.000.

Daiichi Seiyaku Co., Ltd.: *See—*
Hayakawa, Isao, 4,535,161, Cl. 546-94.000.

Daimaru, Akimasa: *See—*
Ban, Keisuke; and Daimaru, Akimasa, 4,534,400, Cl. 164-97.000.

Daimler-Benz Aktiengesellschaft: *See—*
Eltze, Georg; Luttge, Klaus; Pickard, Jurgen; Rubmann, Hans; and Sandner, Helmut, 4,534,457, Cl. 192-70.200.

Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Sakamoto, Takashi, 4,535,365, Cl. 358-287.000.

Daiwa Golf Co., Ltd.: *See—*
Yamada, Magoichi, 4,534,564, Cl. 273-169.000.

Damman, Ben; Scheffer, Hans; de Witte, Paul; Krause, Johannes; Haas, Hans; and Kowalski, Werner, to Hoechst Aktiengesellschaft. Process for making alkali metal polyphosphates. 4,534,946, Cl. 423-315.000.

Damrau, Wayne A.; Vreeland, William C.; Bernert, Richard; and Wohrle, Albert, to Consolidated Papers, Inc.; and J. M. Voith GmbH. Paper coating apparatus. 4,534,309, Cl. 118-410.000.

Dana Corporation: *See—*
Belter, Jerome G., 4,534,572, Cl. 277-235.00B.

Danfoss A/S: *See—*
Harvest, Nils-Olle; and Melamed, Anna, 4,535,280, Cl. 318-798.000.

Daniels, Edward P.: *See—*
Dlugos, Daniel F.; and Daniels, Edward P., 4,535,419, Cl. 364-900.000.

Danko, Arthur J., to Phillips Plastics Corporation. Support assembly and apparatus using same. 4,534,530, Cl. 248-239.000.

Data, Harry L.: *See—*
Riggs, Peter P.; Data, Harry L.; and Hoganson, Robert B., Jr., 4,534,162, Cl. 57-217.000.

Daumit, Gene P.: *See—*
McAliley, J. Eugene; Daumit, Gene P.; and Ethridge, Fredrick A., 4,534,919, Cl. 264-29.200.

Davis, Delbert A.: *See—*
Bruner, Jeffrey W.; Davis, Delbert A.; and Leach, Jack, 4,535,015, Cl. 428-44.000.

Davis, James E., to Lenzar Optics Corporation. Adapter for boresight telescope. 4,534,116, Cl. 33-234.000.

Davis, James W.; Leininger, Joel C.; Munoz-Bustamante, Carlos; and Robbins, Gordon J., to International Business Machines Corporation. Switch logic for shift register latch pair. 4,535,467, Cl. 377-81.000.

Davis, L. Berkley, Jr.; Hilt, Milton B.; and Wilkes, Colin, to General Electric Co. Catalytic combustion system. 4,534,165, Cl. 60-39.020.

Day, Gene F.: *See—*
Wilcox, Jean K.; and Day, Gene F., 4,535,345, Cl. 346-159.000.

Day, San-Tong. Fully automatic single push button type umbrella. 4,534,374, Cl. 135-22.000.

Dayco Corporation: *See—*
Howerton, Anderson W.; and Lewis, James A., 4,534,437, Cl. 180-185.000.

Daymarc Corporation: *See—*
Cedrone, Nicholas J.; and Lee, Kenneth R., 4,534,605, Cl. 339-75.00M.

De Dietrich & Cie: *See—*
Logel, Bernard; and Koehl, Robert, 4,535,226, Cl. 219-400.000.

DeAngelis, Thomas P., to Corning Glass Works. Electrolytic Al production with reaction sintered multiphase ceramic. 4,534,835, Cl. 204-67.000.

Dearden, Katryna J.: *See—*
Atkinson, Alan W.; Dearden, Katryna J.; and Lancaster, Janet M., 4,534,922, Cl. 264-119.000.

DeBlauwe Lier B.V.: *See—*
Browne, Gwendolen, 4,534,876, Cl. 252-90.000.

de Bruyn, Hendrik E., to Stichting Steunfonds Laboratorium voor Werkplaatstechnieck en Organisatie van de Technische Hogeschool Delft. Method for the prevention of arcing in a spark erosion process. 4,535,217, Cl. 219-69.00M.

de Bruyne, Norman A., to Techne Corporation. Floating magnetic stirrer with driving guide rod. 4,534,656, Cl. 366-247.000.

Decsei, Lajos: *See—*
Szejtli, Jozsef; Fenyvesi, Eva; Zsadon, Bela; Szilasi, Maria; and Decsei, Lajos, 4,535,152, Cl. 536-103.000.

Defontaine S.A.: *See—*
Piquin, Jean-Claude, 4,534,082, Cl. 15-315.000.

Degen, Peter J.: *See—*
Pall, David B.; Degen, Peter J.; and Mischenko, John, III, 4,534,388, Cl. 141-1.000.

Degtev, Evgeny I.: *See—*
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; Karavaev, Alexandr A.; and Yakushev, Vladimir M., 4,534,348, Cl. 128-305.000.

Deis, Daniel W.: *See—*
Heyne, Carl J.; and Deis, Daniel W., 4,534,263, Cl. 89-8.000.

De Jonckheere, Raphael; and Dussaud, Jacques, to Boussac Saint Freres B.S.F. Diaper. 4,534,769, Cl. 604-369.000.

Deland, Francois. Water cooler bottle closure. 4,534,484, Cl. 215-307.000.

de Leur, Eric J. A.; and Heijenga, Berend. Accessory for counteracting the consequences of vesical incontinence with males. 4,534,353, Cl. 128-346.000.

Delhaes, Pierre: *See—*
Canet, Roland; Delhaes, Pierre; Dupart, Eliane; Pacault, Adolphe; Pascal, Claude; and Manceau, Jean-Pierre, 4,535,317, Cl. 338-36.000.

Dellinger, Charles L.: *See—*
Bush, Thomas J.; Dellinger, Charles L.; and Fregeolle, Gerald P., 4,534,109, Cl. 30-260.000.

de Lorenzo, Mark X.; Hoffpauir, Charles R.; Hutchins, Johnnie R.; Meyer, Timmy R.; Page, John E.; and Poehl, Michael E., to Standard Oil Company (Indiana). Method and apparatus for controlling the discharge of product from vapor phase polymerization of monomers in a horizontal stirred-bed reactor. 4,535,134, Cl. 526-88.000.

De Luca, Paul V.; and Neuwirth, Helmuth, to Porta Systems Corp. Telephone protector module with auxiliary fusible element. 4,535,379, Cl. 361-124.000.

DeMarco, Ronald A.: *See—*
Kovacina, Thomas A.; DeMarco, Ronald A.; and Snow, Arthur W., 4,535,011, Cl. 427-255.600.

Dengen Automatic Co. Ltd.: *See—*
Okuno, Toshinori; and Nakamura, Hiroshi, 4,534,561, Cl. 273-149.00R.

Denny Bros. Printing: *See—*
Howard, Robin G., 4,534,582, Cl. 283-81.000.

Desjardins, Yvon. Sandblaster. 4,534,139, Cl. 51-438.000.

DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,535,122, Cl. 524-809.000.

Dettmann, Heinrich, to Burkert GmbH. Pulsed magnetic valve assembly. 4,534,539, Cl. 251-65.000.

Dettmers, Michael: *See—*
Weirich, Walter; and Dettmers, Michael, 4,534,681, Cl. 405-294.000.

Deutsche Babcock Werke Aktiengesellschaft: *See—*
Buchmuller, Horst; and Michelbrink, Bernhard, 4,534,299, Cl. 110-165.00R.

Deutschmann, Herbert; and Dinger, Hans, to MTU-Motoren-und Turbinen-Union Friedrichshafen GmbH. Valve control for a reciprocating piston internal combustion engine. 4,534,324, Cl. 123-90.220.

De Vries, Jan W., to Isem B.V. Mixing apparatus, having seals which may be satisfactorily cleaned, particularly for the pharmaceutical industry. 4,534,658, Cl. 366-287.000.

de Witte, Paul: *See—*
Damman, Ben; Scheffer, Hans; de Witte, Paul; Krause, Johannes; Haas, Hans; and Kowalski, Werner, 4,534,946, Cl. 423-315.000.

Dham, Vinod K.; Honnigford, Edward H.; Stewart, John K., Jr.; Pfeifer, Robert F.; and Trudel, Murray L., to NCR Corporation. Mixed dielectric process and nonvolatile memory device fabricated thereby. 4,534,104, Cl. 29-571.000.

Dhein, Rolf: *See—*
Ebert, Wolfgang; Meyer, Rolf-Volker; Idel, Karsten-Josef; and Dhein, Rolf, 4,535,149, Cl. 528-388.000.

Diafloc Co., Ltd.: *See—*
Handa, Ryoji; Hosoda, Jun; and Yoshida, Norimasa, 4,535,131, Cl. 525-369.000.

Diamond Shamrock Chemicals Company: *See—*
Papadakis, Nicholas, 4,534,356, Cl. 128-635.000.

Diaz, Carlos: *See—*
Ambrose, John; Charles, Douglas K.; Conard, Bruce R.; Diaz, Carlos; O'Neill, Charles E.; and Leavoy, Wayne P., 4,534,935, Cl. 419-23.000.

Diaz, Paul T.: *See—*
Fife, Michael J.; Diaz, Paul T.; and Dietz, Dennis R., 4,534,221, Cl. 73-626.000.

Dickey-john Corporation: *See—*
Funk, David B.; and Kallmeyer, James B., 4,534,229, Cl. 73-863.000.

DiDomenico, Edward D.: *See*—
Gladfelter, Elizabeth J.; Rogier, Edgar R.; and DiDomenico, Edward D., 4,535,148, Cl. 528-365.000.

Diehl GmbH & Co.: *See*—
von Laar, Klaus; Heberlein, Werner; and Burda, Josef, 4,534,294, Cl. 102-520.000.
Weber, Adolf; Strauss, Hans; and Pauly, Hans, 4,534,292, Cl. 102-241.000.

Diener, Lawrence R.: *See*—
Ventimiglia, Joseph J.; and Diener, Lawrence R., 4,534,391, Cl. 150-52.00R.

Diesch, Robert E.: *See*—
Euteneuer, Charles L.; and Diesch, Robert E., 4,534,519, Cl. 242-68.300.

Dietrich, Anton: *See*—
Hartig, Klaus; Dietrich, Anton; and Scherer, Michael, 4,534,841, Cl. 204-192.00P.

Dietz, Dennis R.: *See*—
Fife, Michael J.; Diaz, Paul T.; and Dietz, Dennis R., 4,534,221, Cl. 73-626.000.

Dietz, Gunter; and Flagmeyer, Friedhelm, to Gebr. Happich GmbH. Actuating knob, particularly for window cranks of automotive vehicles. 4,534,240, Cl. 74-545.000.

Digital Equipment Corporation: *See*—
Abraham, Menachem, 4,535,233, Cl. 250-214.00A.

Digital Recording Research Limited Partnership: *See*—
Weaver, Charles S., 4,535,320, Cl. 340-347.0DD.

Dilling, Peter, to Westvaco Corporation. Selective crosslinking of low molecular weight sulfonated lignins and lignosulfate products produced thereby. 4,534,771, Cl. 8-524.000.

Dillon, Michael A.; and Rawlings, David L., to International Hydron Corporation. Cutting device for the precision trimming of the edge of a centrifugally cast lens. 4,534,723, Cl. 425-289.000.

Dinger, Hans: *See*—
Deutschmann, Herbert; and Dinger, Hans, 4,534,324, Cl. 123-90.220.

Di Pardo, Robert M.; and Bock, Mark G., to Merck & Co., Inc. Process for preparing certain substituted 4-thiazolidinones. 4,535,164, Cl. 548-187.000.

Dippel, Theodor; and Loida, Andreas, to Kernforschungszentrum Karlsruhe GmbH. Method for solidifying radioactive wastes. 4,534,893, Cl. 252-629.000.

Dirkse, Franciscus J.; and Kulberg, Gerardus H., deceased (by Kulberg-Nierstrasz, Julia F., heiress), to Siemens Gammasonics, Inc. Method and a circuit for processing pulses of a pulse train. 4,535,242, Cl. 250-363.00S.

Discovision Associates: *See*—
Pullen, Alan J., 4,535,366, Cl. 358-342.000.

Dlugos, Daniel F.; and Daniels, Edward P., to Pitney Bowes Inc. System and method for computing fractional postage values. 4,535,419, Cl. 364-900.000.

Doble, Henry P., Jr.: *See*—
Nuckols, Walter S.; Leonard, Walter G.; and Doble, Henry P., Jr., 4,534,468, Cl. 206-534.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Hofmann, Peter, 4,534,275, Cl. 98-2.000.

Dr. Ing. h.c.F. Porsche A.G.: *See*—
Hausinger, Otto, 4,534,746, Cl. 464-170.000.

Doerner, Frank. Cover for chair leg. 4,534,533, Cl. 248-345.100.

Doi, Shinji: *See*—
Inoue, Sukejiro; Sasakawa, Masumi; Fukumoto, Hiroshi; and Doi, Shinji, 4,535,048, Cl. 430-110.000.

Doiron, Laurea, Jr., to Emtek, Inc. Arrangement and method for current density control in electroplating. 4,534,832, Cl. 204-15.000.

Dolan, John P.: *See*—
Stieg, Richard F.; Dolan, John P.; Worley, W. Spencer; and Gerbert, Goran, 4,534,748, Cl. 474-17.000.

Dolnik, Thomas G.: *See*—
Jindrick, James A.; Dolnik, Thomas G.; Nohria, Naresh K.; Gilker, Clyde; Hurley, James R.; Dunk, Michael P.; Reis, Norbert J.; and Bray, Thomas J., 4,535,409, Cl. 364-481.000.

Dolphin Titan International, Inc.: *See*—
Albaugh, Edward K., 4,534,677, Cl. 405-203.000.

Doman, H. Michael: *See*—
Mowat, Donald J.; and Doman, H. Michael, 4,534,438, Cl. 180-209.000.

Donahue, Robert H.: *See*—
Cristell, Frank A., 4,534,147, Cl. 52-287.000.

D'Onofrio, Anthony; and Kitik, Walter, to Timex Corporation. Process for making an electroluminescent lamp. 4,534,743, Cl. 445-24.000.

Dorner, Steven C. Shelf bracket and cooperable locking bracket retainer. 4,534,529, Cl. 248-222.100.

Dorries, Peter; Gotze, Thomas; Piesch, Steffen; Schon, Manfred; Wulff, Gunther; Hintermeier, Karl; Wulff, Gunther; and Hintermeier, Karl, to Cassella Aktiengesellschaft. Modified aminoplast, its preparation and its use. 4,535,031, Cl. 428-481.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Kanbe, Mitsuru, 4,534,712, Cl. 417-366.000.

Dotson, Ronald L.: *See*—
Woodard, Kenneth E., Jr.; and Dotson, Ronald L., 4,534,846, Cl. 204-290.00R.

Douglas, Ellwood S.: *See*—
Mosher, Oren A.; and Douglas, Ellwood S., 4,534,428, Cl. 177-1.000.

Dourdeville, Theodore A.; and Lymneos, Anthony, to Millipore Corporation. Passive fluid mixing system. 4,534,659, Cl. 366-338.000.

Dovan, Hoai T.; and Hutchins, Richard D., to Union Oil Company of California. Continuous permeability reduction in subterranean reservoirs. 4,534,412, Cl. 166-295.000.

Dow Chemical Company, The: *See*—
Collins, Guy R., 4,534,903, Cl. 260-465.50R.
Evani, Syamalarao; Oswald, James H.; Staples, Thomas L.; and Polak, Brent T., 4,535,098, Cl. 521-149.000.
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,535,120, Cl. 524-560.000.
McIntyre, James A.; and Phillips, Robert F., 4,534,845, Cl. 204-283.000.
Park, Chung P.; and Suh, Kyung W., 4,535,094, Cl. 521-79.000.
Phillips, Dorothy J., 4,534,969, Cl. 424-118.000.
Rose, Gene D., 4,534,875, Cl. 252-71.000.

Dow Corning Corporation: *See*—
Baney, Ronald H., 4,534,948, Cl. 423-345.000.
Cannady, John P., 4,535,007, Cl. 427-226.000.
Kosal, Jeffrey A.; and Plueddemann, Edwin P., 4,534,880, Cl. 252-174.130.
Kroupa, Loretta A., 4,535,141, Cl. 528-15.000.
Martin, David L., 4,534,928, Cl. 264-334.000.

Downs, Michael J. Surface profile interferometer. 4,534,649, Cl. 356-351.000.

Dreesman, Gordon R.; and Kendall, Cynthia E., to AMF Incorporated. Immunoassay employing monoclonal herpes simplex antibody and biotin-avidin detection system. 4,535,057, Cl. 435-5.000.

Drefahl, Jens. Roof covering. 4,534,142, Cl. 52-90.000.

Drupsteen, Jan, to U.S. Philips Corporation. Fourth-order digital multiplex system for transmitting a plurality of digital signals at a nominal bit rate of 44 736 kbit/s. 4,535,451, Cl. 370-99.000.

Drzewiecki, Thadeusz M.: *See*—
Phillippi, R. Michael; and Drzewiecki, Thadeusz M., 4,534,383, Cl. 137-840.000.

Duchemin, Jean-Pierre: *See*—
Moreau, Dominique; Duchemin, Pierre; and Duchemin, Jean-Pierre, 4,535,309, Cl. 335-42.000.

Duchemin, Pierre: *See*—
Moreau, Dominique; Duchemin, Pierre; and Duchemin, Jean-Pierre, 4,535,309, Cl. 335-42.000.

Ducros, Guy, to Technique et Esthetique pour l'Industrie et la Distribution. Device for decanting a liquid from a recipient. 4,534,377, Cl. 137-212.000.

Dueber, Thomas E.: *See*—
Anderson, Albert G.; and Dueber, Thomas E., 4,535,052, Cl. 430-277.000.

DuFrene, Clement O., to Rosenmeier, Gordon, a part interest. Control valve apparatus and steering systems. 4,534,436, Cl. 180-144.000.

Dugre, Michael A. Variable color floodlight. 4,535,394, Cl. 362-231.000.

Duijkers, Peter A., to U.S. Philips Corporation. Line synchronizing circuit for a picture display devices and picture display device comprising such a circuit. 4,535,358, Cl. 358-158.000.

Dunk, Michael P.: *See*—
Jindrick, James A.; Dolnik, Thomas G.; Nohria, Naresh K.; Gilker, Clyde; Hurley, James R.; Dunk, Michael P.; Reis, Norbert J.; and Bray, Thomas J., 4,535,409, Cl. 364-481.000.

Dunmire, Howard L.: *See*—
Horn, Stuart B.; Wright, Richard A.; and Dunmire, Howard L., 4,534,176, Cl. 62-6.000.

Dupart, Eliane: *See*—
Canet, Roland; Delhaes, Pierre; Dupart, Eliane; Pacault, Adolphe; Pascal, Claude; and Manceau, Jean-Pierre, 4,535,317, Cl. 338-36.000.

Du Pont de Nemours, E. I., and Company: *See*—
Adams, John B., Jr., 4,534,788, Cl. 71-92.000.
Anderson, Albert G.; and Dueber, Thomas E., 4,535,052, Cl. 430-277.000.
Forrest, Albert W., Jr., 4,534,918, Cl. 264-22.000.
Middleton, William J., 4,535,184, Cl. 564-102.000.
Reap, James J., 4,534,789, Cl. 71-93.000.
Squire, Edward N., 4,535,175, Cl. 549-455.000.
Wheland, Robert C., 4,535,136, Cl. 526-214.000.
Wolf, Anthony D., 4,534,790, Cl. 71-93.000.

DuPont, Preston S.; Ritter, Robert E.; and Stafford, John P., to Hughes Aircraft Company. Conductive coating process. 4,534,998, Cl. 427-122.000.

Duracell Inc.: *See*—
Kelm, Roger W.; Merry, Glenn W.; and McArthur, William J., 4,535,036, Cl. 429-99.000.

Durkoppwerke GmbH: *See*—
Reinke, Kurt, 4,534,304, Cl. 112-262.100.

Durrnagel, Klaus; Jeschke, Willi; and Jahn, Hans-Georg, to Heidelberger Druckmaschinen AG. Cooling roller with different preselected cooling zones. 4,534,289, Cl. 101-348.000.

Duryee, Peter S.; and Anholm, John M., Jr., to John Fluke Mfg. Co., Inc. Calibration apparatus for systems such as analog to digital converters. 4,535,318, Cl. 340-347.0CC.

Dussaud, Jacques: *See*—
De Jonckheere, Raphael; and Dussaud, Jacques, 4,534,769, Cl. 604-369.000.

Dutt, Herbert V.: *See*—
Santostasi, Paul A.; Dutt, Herbert V.; and Pirkau, Arno F., 4,534,480, Cl. 215-252.000.

Duwel, Edward C.; and Soderberg, John H., to Pitney Bowes Inc. Universal real time transparent asynchronous serial/echoplex converter. 4,535,421, Cl. 364-900.000.

Duwel, Edward C.: *See*—
Eckert, Alton B.; Soderberg, John H.; and Duwel, Edward C., 4,535,407, Cl. 364-464.000.

Dyer, Kermit W.: *See*—
Parks, James D.; Moss, Charles A.; and Dyer, Kermit W., 4,534,281, Cl. 98-115.300.

Dynacycle Corporation: *See*—
Irwin, Everett F., 4,534,272, Cl. 91-493.000.

Dynamics Research Corporation: *See*—
Volpe, Luke; and Thomas, Lowell E., 4,534,814, Cl. 156-300.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Peeters, Hermann; Vogt, Wilhelm; and Theis, Christoph, 4,534,910, Cl. 260-465.600.

E.M.M. s.r.l. Emiliana Macchine Maglierie: *See*—
Stoppazzini, Benito, 4,534,186, Cl. 66-75.200.

E. R. Squibb & Sons, Inc.: *See*—
Natarajan, Sesha I.; and Gordon, Eric M., 4,535,176, Cl. 560-27.000.
Treuner, Uwe D.; and Breuer, Hermann, 4,534,896, Cl. 260-239.00A.

Eagle Industry Co., Ltd.: *See*—
Ishitani, Kenichiro; Unseki, Takashi; Amiboshi, Saburo; and Kawamura, Eiichi, 4,534,569, Cl. 277-27.000.

Eastman Kodak Company: *See*—
Fearnside, William T., 4,535,359, Cl. 358-163.000.
Ksaacson, Henry V.; and Wright, Hal E., 4,535,046, Cl. 430-78.000.

Eaton Corporation: *See*—
Stump, Paul O.; and Taylor, Calvin G., 4,534,695, Cl. 414-749.000.
Zukausky, Keith E., 4,534,537, Cl. 251-30.030.

Ebara Corporation: *See*—
Yasuda, Takashi; Inoue, Naoyuki; and Tanaka, Syouji, 4,534,180, Cl. 62-141.000.

Eberhardt, John E., to Australian Atomic Energy Commission. Measuring the concentration of gaseous hydrogen fluoride. 4,535,241, Cl. 250-339.000.

Eberle, William J., to General Battery Corporation. Automatic battery stacker. 4,534,549, Cl. 271-103.000.

Ebert, Wolfgang; Meyer, Rolf-Volker; Idel, Karsten-Josef; and Dhein, Rolf, to Bayer Aktiengesellschaft. Process for the production of polyarylene sulphides. 4,535,149, Cl. 528-388.000.

Ebi, Yutaka: *See*—
Horike, Masanori; Furukawa, Tatsuya; Ebi, Yutaka; and Yamazaki, Hiroshi, 4,535,339, Cl. 346-75.000.

Eccleston, Larry, to Progressive Dynamics, Inc. Preamplifying and signal processing method and apparatus for theft detection systems. 4,535,323, Cl. 340-572.000.

Eckert, Alton B.; Soderberg, John H.; and Duwel, Edward C., to Pitney Bowes Inc. Postage meter with keyboard keys for changing postage unused amount. 4,535,407, Cl. 364-464.000.

Eden, Per-Olof: *See*—
Jonsson, Mats; and Eden, Per-Olof, 4,534,231, Cl. 73-864.430.

Edwards Engineering Corporation: *See*—
Edwards, Ray C., 4,534,849, Cl. 208-11.00R.

Edwards, John V.: *See*—
Steer, Peter L.; and Edwards, John V., 4,534,766, Cl. 604-323.000.

Edwards, Paul R.: *See*—
Crosbie, Richard J.; and Edwards, Paul R., 4,534,338, Cl. 128-1.00A.

Edwards, Ray C., to Edwards Engineering Corporation. Method for aboveground separation, vaporization and recovery of oil from oil shale. 4,534,849, Cl. 208-11.00R.

Efamol Limited: *See*—
Horrobin, David F., 4,535,093, Cl. 514-560.000.

Egawa, Takeshi: *See*—
Miki, Yukio; and Egawa, Takeshi, 4,534,621, Cl. 350-257.000.

Eheim, Franz; and Laufer, Helmut, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines with an adjustment of the instant of injection. 4,534,332, Cl. 123-502.000.

Ehrat, Kurt, to GRETAG Aktiengesellschaft. Mechanical lock having a variable key. 4,534,195, Cl. 70-316.000.

Ehret, Robert J.: *See*—
Stephens, Donald E.; and Ehret, Robert J., 4,534,941, Cl. 422-70.000.

Eichelberger, Charles W.: *See*—
Miller, Edward B.; and Eichelberger, Charles W., 4,535,332, Cl. 340-825.060.

Eidson, Lawrence E. Cover plate fastening device. 4,534,486, Cl. 220-241.000.

Eistrat, Thomas. Combined chain saw and positioning tool. 4,534,111, Cl. 30-371.000.

Ekber, Boris Y.: *See*—
Bragin, Boris F.; Kolomiets, Alexandr S.; Korotkikh, Jury B.; Markuntovich, Felix D.; Olofinsky, Evgeny P.; Gladky, Petr V.; Perepletchikov, Evgeny F.; and Ekber, Boris Y., 4,534,540, Cl. 251-203.000.

Electric Power Research Institute, Inc.: *See*—
Reichman, James M.; O'Hanlon, Thomas A.; and Kendrew, Thomas J., 4,534,425, Cl. 175-53.000.

Electrical Equipment Limited: *See*—
Khatri, Dilip K., 4,535,254, Cl. 307-38.000.

Electro Materials Corp. of America: *See*—
Martin, F. Wayne; Shahbazi, Samson; and Schoonejongen, Ronald J., 4,535,012, Cl. 427-386.000.

Eli Lilly & Company: *See*—
Akers, Michael J.; Hargrove, William W.; Harris, Dale C.; and Sperry, Charles R., 4,534,758, Cl. 604-85.000.

Elischer, Stefan; Hobel, Hans-Gunther; Merkt, Robert; and Wagner, Fritz, to SKW Trostberg Aktiengesellschaft. Process for obtaining solid cyanuric chloride in finely divided form. 4,535,160, Cl. 544-191.000.

Elliott, Charles T.; White, Anthony M.; and Field, Howard J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Method of biasing a photoconductive detector and detector apparatus therefor. 4,535,232, Cl. 250-206.000.

Elliott, Guy R. B. Magnesium reduction of uranium oxide. 4,534,792, Cl. 75-84.10R.

Ellis, Edward J.; and Salamone, Joseph C., to Polymer Technology Corporation. Abrasive-containing contact lens cleaning materials. 4,534,878, Cl. 252-173.000.

Elsmo, Thad F. Tray assembly. 4,534,469, Cl. 206-560.000.

Eltech Innovations Inc.: *See*—
Larson, Eldon E., 4,534,449, Cl. 184-105.200.

Eltech Systems Corporation: *See*—
McCain, G. Howard; Benezra, Leo L.; and Finch, Craig E., 4,535,112, Cl. 524-233.000.

Eltze, Georg; Luttge, Klaus; Pickard, Jurgen; Rubmann, Hans; and Sandner, Helmut, to Daimler-Benz Aktiengesellschaft. Multi-disc clutch or brake with a resilient clamping means insertable between a lamella and the associated lamella carrier. 4,534,457, Cl. 192-70.200.

Emerson Electric Co.: *See*—
Newberg, Barry M., 4,535,262, Cl. 310-88.000.

Emtek, Inc.: *See*—
Doiron, Laurea, Jr., 4,534,832, Cl. 204-15.000.

Encon Products, Inc.: *See*—
Simpson, Harold G.; and Neyer, Leo E., 4,534,148, Cl. 52-640.000.

Endo, Tamotu, to Tokyo Shibaura Denki Kabushiki Kaisha. Overcurrent detector for an inverter. 4,535,378, Cl. 361-18.000.

Energy Conversion Devices, Inc.: *See*—
Yu, Terry T., 4,535,055, Cl. 430-353.000.

Energy Development Associates, Inc.: *See*—
Carr, Peter; and Rowan, John W., 4,534,833, Cl. 204-128.000.

Engelhard Corporation: *See*—
Novak, William J.; and McClung, Ronald G., 4,534,943, Cl. 422-188.000.
Sweeney, William J., 4,534,315, Cl. 119-1.000.

Engh, Gordon L., to Nekoosa Envelopes, Inc. Product and method for using airline tickets. 4,534,581, Cl. 281-15.00R.

Ensing, Lukas, to Shell Internationale Research Maatschappij B.V. Transmitter for an electromagnetic survey system with improved power supply switching system. 4,535,292, Cl. 324-330.000.

Ensminger, Robert J., to Arthur G. Russell Company, Incorporated, The. Article transfer mechanism. 4,534,696, Cl. 414-751.000.

Environmental Protection Systems, Limited: *See*—
Roydhouse, Richard H., 4,534,944, Cl. 423-210.000.

Epson Corporation: *See*—
Mori, Masahiko; Arai, Kenichiro; and Tezuka, Chikao, 4,534,665, Cl. 400-145.200.

ERCO Industries Limited: *See*—
Rapson, W. Howard; and Fredette, Maurice C. J., 4,534,952, Cl. 423-478.000.

Erfurt, George A.: *See*—
Gellman, Gary; Erfurt, George A.; and Roe, James E., 4,534,989, Cl. 426-549.000.
Gellman, Gary; Erfurt, George A.; and Roe, James E., 4,534,990, Cl. 426-549.000.

Ericksen, James P.; and Stack, Timothy F., to United Technologies Corporation. Differential receiver with self-adaptive hysteresis. 4,535,294, Cl. 328-150.000.

Erickson, Dale C.; and Erickson, Norton J., to Nordale Incorporated. Evaporator apparatus. 4,534,828, Cl. 159-16.100.

Erickson, Norton J.: *See*—
Erickson, Dale C.; and Erickson, Norton J., 4,534,828, Cl. 159-16.100.

Eslinger, Delano R.: *See*—
Ambrose, Ronald R.; Chang, Wen-Hsuan; McKeough, David T.; Eslinger, Delano R.; and Porter, Samuel, Jr., 4,535,132, Cl. 525-443.000.

Esser, Wilhelm C. J., to AMP Incorporated. Receptacle terminal having locking lance. 4,534,613, Cl. 339-258.00S.

Estlund, Kenneth F.: *See*—
Estlund, Paul D.; and Estlund, Kenneth F., 4,534,556, Cl. 273-1.50R.

Estlund, Paul D.; and Estlund, Kenneth F. Break-away basketball goal. 4,534,556, Cl. 273-1.50R.

ETA S.A., Fabriques d'Ebauches: *See*—
Laesser, Claude, 4,534,660, Cl. 368-220.000.

Ethicon, Inc.: *See*—
Golden, Donald M.; and McVay, William P., 4,534,350, Cl. 128-334.00C.

Ethridge, Fredrick A.: *See*—
McAliley, J. Eugene; Daumit, Gene P.; and Ethridge, Fredrick A., 4,534,919, Cl. 264-29.200.

Ethyl Corporation: *See*—
Mueller, Warren B., 4,535,095, Cl. 521-89.000.
Thomas, Paul E.; and Raley, Garland E., 4,535,020, Cl. 428-131.000.

Euteneuer, Charles L.; and Diesch, Robert E., to Pako Corporation. Photographic paper roll core holding device. 4,534,519, Cl. 242-68.300.

Evani, Syamalarao; Oswald, James H.; Staples, Thomas L.; and Polak, Brent T., to Dow Chemical Company, The. Material for absorbing aqueous fluids. 4,535,098, Cl. 521-149.000.

Evans, Brian E.; Hemm, Stephen R.; and Russell, Rupert A. V., to Wiggins Teape Group Limited, The. Apparatus for determining an electrical characteristic of a fibrous dispersion. 4,535,285, Cl. 324-71.100.

Everett, Harry J.: *See*—
MacArthur, Alexander D.; and Everett, Harry J., 4,534,320, Cl. 122-406.00R.

Ewy, M. Dale: *See*—
Borish, Jeffrey G.; and Ewy, M. Dale, 4,535,474, Cl. 381-61.000.

Exxon Production Research Co.: *See*—
Ramsey, Mark S., 4,534,424, Cl. 175-40.000.

Exxon Research and Engineering Co.: *See*—
Allan, David E.; and Martinez, Charles H., 4,534,851, Cl. 208-48.00R.
Vaughan, David E. W., 4,534,947, Cl. 423-329.000.
Weinberg, Harold N.; Savage, David W.; and Weissman, Walter, 4,534,854, Cl. 208-131.000.

Eylon, Daniel; and Froes, Francis H., to United States of America, Air Force. Method for refining microstructures of prealloyed powder metallurgy titanium articles. 4,534,808, Cl. 148-133.000.

Fabrizio, Raymond. Vent key modification for flute. 4,534,261, Cl. 84-384.000.

Facuseh, Elias. Cleaning device. 4,534,670, Cl. 401-270.000.

Fagel, Roger. Self-propelled armored vehicle. 4,534,267, Cl. 89-40.030.

Fagnoni, Giovanna Maria. Transportable pre-fabricated building structure. 4,534,141, Cl. 52-68.000.

Fahmy, Mohamed A. [illegible], to FMC Corporation. O-ethyl S,S-dialkyl phosphorodithioates for use as pesticides. 4,535,077, Cl. 514-143.000.

Fairchild Camera & Instrument Corp.: *See*—
Bley, David W., 4,534,602, Cl. 339-14.00R.

Fairey Hydraulics, Ltd.: *See*—
Avery, Robert W., 4,535,263, Cl. 310-112.000.

Fairman, Ronald E.: *See*—
Wright, Eric C.; and Fairman, Ronald E., 4,534,599, Cl. 303-22.00R.

Falconer, David D., to AT&T Bell Laboratories. Echo cancellation in two-wire full-duplex data transmission with estimation of far-end data components. 4,535,206, Cl. 179-170.200.

Falk, Jerry: *See*—
Carey, Richard A.; and Falk, Jerry, 4,535,330, Cl. 340-825.500.

Falzone, Vincenzo; and Tommasi, Marcello, to Italtel Societa Italiana Telecomunicazioni S.p.A. Digital switching exchange for telephone systems. 4,535,444, Cl. 370-58.000.

Fannin, Wayne V.; and Pees, James M., to General Motors Corporation. Vehicle suspension unit with replacement air spring. 4,534,545, Cl. 267-64.240.

Fanuc Ltd.: *See*—
Kishi, Hajimu; Tanaka, Kunio; and Seki, Masaki, 4,535,408, Cl. 364-475.000.
Komiya, Hidetsugu; and Yamazaki, Etsuo, 4,534,685, Cl. 409-99.000.
Kurakake, Mitsuo, 4,535,277, Cl. 318-561.000.
Nakamura, Kosei; and Takano, Yoshikazu, 4,534,686, Cl. 409-135.000.

Farrall, George A., to General Electric Company. Method for assessing the dielectric state of a high voltage vacuum device using radiation generated by field emission current. 4,534,741, Cl. 445-3.000.

Fasano, Anthony; Roberts, John H.; and Motycka, David L., to United Technologies Corporation. Method and apparatus for determining the accuracy of wind tunnel test data. 4,534,216, Cl. 73-147.000.

Favie, Claude; and Mercadier, Michel, to Societe Nationale Elf Aquitaine (Production). Cosmetological polymers. 4,535,130, Cl. 525-327.300.

Fearnside, William T., to Eastman Kodak Company. Defect correction in solid state imaging. 4,535,359, Cl. 358-163.000.

Federal-Mogul Corporation: *See*—
Ladin, Eli M., 4,534,458, Cl. 192-98.000.

Federal Paper Board Co., Inc.: *See*—
Neale, Douglas L., 4,534,497, Cl. 225-25.000.

Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; Karavaev, Alexandr A.; and Yakushev, Vladimir M., to Moskovsky Nauchno-Issledovatelsky Institut Mirrokhirurgii Glaza. Instrument for making corneal incisions. 4,534,348, Cl. 128-305.000.

Fehrer, Ernst. Apparatus for making fibrous webs. 4,534,086, Cl. 19-99.000.

Feld, Gerhard; and Schmidt-Kufeke, Klaus-Peter. Process for making fine perforations in plastic sheeting and/or plastic or rubber coated sheet materials. 4,534,994, Cl. 427-37.000.

Felix, Raymond A., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,534,902, Cl. 260-465.400.

Felix, Raymond A., to Stauffer Chemical Company. N-carboalkoxymethyl-N-halomethyl amides. 4,535,181, Cl. 560-172.000.

Fenska, Lyle E.: *See*—
Mark, Harold W.; Bertus, Brent J.; Roberts, John S.; McKay, Dwight L.; and Fenska, Lyle E., 4,535,066, Cl. 502-62.000.

Fenyvesi, Eva: *See*—
Szejtli, Jozsef; Fenyvesi, Eva; Zsadon, Bela; Szilasi, Maria; and Decsei, Lajos, 4,535,152, Cl. 536-103.000.

Ferag AG: *See*—
Reist, Walter, 4,534,550, Cl. 271-183.000.

Ferguson, Vivian: *See*—
Off, Joseph W. A.; and Ferguson, Vivian, 4,534,303, Cl. 112-114.000.

Fernie, Douglas P.: *See*—
Collins, Ian P.; and Fernie, Douglas P., 4,534,339, Cl. 128-6.000.

Ferrell, Robert A.; and Rebber, Richard G., to KCL Corporation. Apparatus and method for securing top ends of sack gussets. 4,534,752, Cl. 493-213.000.

Ferrer Internacional, S.A.: *See*—
Forne , Ernesto; Foguet, Rafael; Sacristan, Aurelio; and Ortiz, Jose A., 4,535,159, Cl. 544-148.000.

Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Board game with reversible secondary pieces. 4,534,566, Cl. 273-248.000.

Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Board game with chance device playing piece. 4,534,567, Cl. 273-255.000.

Ferro, Gregory A.: *See*—
Lee, Raymond; Okey, David W.; and Ferro, Gregory A., 4,535,099, Cl. 521-154.000.
Lee, Raymond; Sorathia, Usman A. K.; and Ferro, Gregory A., 4,535,101, Cl. 521-189.000.

Fesman, Gerald: *See*—
Jacobs, Barry A.; and Fesman, Gerald, 4,535,096, Cl. 521-107.000.

Fetterolf, Gerald S.: *See*—
Gettig, William A.; and Fetterolf, Gerald S., 4,534,763, Cl. 604-239.000.

Fey, Maurice G.: *See*—
Wolf, Charles B.; Meyer, Thomas N.; Fey, Maurice G.; and Heidrich, John E., 4,535,225, Cl. 219-383.000.

Fey, Robert M., to Speed Queen Company. Tilt washer with automatic lid. 4,534,188, Cl. 68-3.00R.

Fiat Auto S.p.A.: *See*—
Filtri, Giorgio, 4,534,329, Cl. 123-383.000.

Field, David J.; Butler, Ernest P.; and Bassett, Katherine-Ann, to Alcan International Limited. Heat treatment of aluminium alloys containing lithium. 4,534,807, Cl. 148-20.300.

Field, Howard J.: *See*—
Elliott, Charles T.; White, Anthony M.; and Field, Howard J., 4,535,232, Cl. 250-206.000.

Fielding, Herbert L.; and Ingwall, Richard T., to Polaroid Corporation. Stabilization of holograms. 4,535,041, Cl. 430-1.000.

Fields, Stanley R., to United States of America, Energy. Container for radioactive materials. 4,535,250, Cl. 250-507.100.

Fierkens, Richardus H. J.; and Pas, Ireneus J. T. M., to ASM Fico Tooling, b.v. Method and apparatus for mold cleaning by reverse sputtering. 4,534,921, Cl. 264-39.000.

Fife, Michael J.; Diaz, Paul T.; and Dietz, Dennis R., to Technicare Corporation. Ultrasonic diagnostic imaging systems for varying depths of field. 4,534,221, Cl. 73-626.000.

Figgie International Inc.: *See*—
McGill, Robert W.; and Robinson, Chris E., 4,534,157, Cl. 53-531.000.
Mitchell, Hal D.; Glover, Richard W.; Walker, Donald R.; and Rosenberg, Isadore, 4,534,068, Cl. 2-414.000.

Filipiak, Stanley E.: *See*—
Shedore, Charles; and Filipiak, Stanley E., 4,535,210, Cl. 200-340.000.

Filtri, Giorgio, to Fiat Auto S.p.A. Supply system for super charged diesel engines. 4,534,329, Cl. 123-383.000.

Filzinger, Klaus: *See*—
Fuchs, Hermann; and Filzinger, Klaus, 4,534,908, Cl. 260-458.00C.

Finch, Craig E.: *See*—
McCain, G. Howard; Benezra, Leo L.; and Finch, Craig E., 4,535,112, Cl. 524-233.000.

Finch, George W.; and Udd, Eric, to McDonnell Douglas Corporation. Fiber-optic seismic sensor. 4,534,222, Cl. 73-653.000.

Finnigan Corporation: *See*—
McIver, Robert T., Jr., 4,535,235, Cl. 250-282.000.

Firestone Tire & Rubber Company, The: *See*—
Yang, James H. C.; Tomaszewski, Walter; and Beneze , Heinz W., 4,534,145, Cl. 52-222.000.

Firmenich SA: *See*—
Holzner, Gunter, 4,534,509, Cl. 239-34.000.

Fischer, Karl-Heinz: *See*—
Bauer, Kurt; Fischer, Karl-Heinz; and Huber, Heinz, 4,535,456, Cl. 371-16.000.

Fischer, Rolf; and Hermann, Dietmar, to Continental Gummi-Werke Aktiengesellschaft. Apparatus for producing profiled strands. 4,534,724, Cl. 425-295.000.

Fischer, Werner; Flaig, Ulrich; and Locher, Johannes, to Robert Bosch GmbH. Emergency control apparatus for a Diesel engine. 4,534,328, Cl. 123-359.000.

Fischer, William C.: *See*—
Johnson, Raymond G., Jr.; Trustee, Bill L.; and Fischer, William C., 4,534,702, Cl. 416-20.00R.

Fish, Leonard A.: *See*—
Glinka, John; and Fish, Leonard A., 4,534,373, Cl. 133-5.00R.

Fisher, Don E.; and Wilkie, Arnold E., to Monsanto Company. Ring spinning processes for converting sliver to carpet yarn. 4,534,161, Cl. 57-125.000.

Fisher, Jed F., to University of Minnesota, Regents of the. Complexation of anthracycline and anthraquinone antibiotics by the apo riboflavin binding protein from eggs. 4,534,971, Cl. 514-21.000.

Fisher, John M., to B. F. Goodrich Company, The. Aircraft slide packing fixture. 4,534,445, Cl. 182-48.000.

Fisher, Robert E.: *See—*
Palm, Richard R.; James, Robert G.; and Fisher, Robert E., 4,534,706, Cl. 417-17.000.

Fishter, Robert E.; McDaniel, Paul L.; and Tefft, Stephen W., to United Technologies Corporation. Chemical milling IN-100 nickel superalloy. 4,534,823, Cl. 156-626.000.

Fitz, Forest G., Jr.: *See—*
Budzich, Mieczlyslaw; and Fitz, Forest G., Jr., 4,534,254, Cl. 83-425.200.

Fitzsimmons, Clement J. Transmission. 4,534,747, Cl. 474-1.000.

Flagmeyer, Friedhelm: *See—*
Dietz, Gunter; and Flagmeyer, Friedhelm, 4,534,240, Cl. 74-545.000.

Flaig, Ulrich: *See—*
Fischer, Werner; Flaig, Ulrich; and Locher, Johannes, 4,534,328, Cl. 123-359.000.

Flanagan, Thomas P.: *See—*
Schoenberg, Jules E.; Flanagan, Thomas P.; and Ray-Chaudhuri, Dilip K., 4,535,140, Cl. 526-329.000.

Flavell, George A. Wind power system. 4,534,703, Cl. 416-119.000.

Flax, Stephen W.: *See—*
Miller-Jones, Stockton M.; and Flax, Stephen W., 4,534,359, Cl. 128-660.000.

Fleck, Guenter: *See—*
Siol, Werner; Rauch, Hubert; and Fleck, Guenter, 4,535,137, Cl. 526-216.000.

Fleming, Paul D., to W & F Manufacturing, Inc. Latch assembly. 4,534,587, Cl. 292-263.000.

Fletcher, Aaron N.: *See—*
McManis, George E., III; Fletcher, Aaron N.; and Miles, Melvin H., 4,535,037, Cl. 429-103.000.

Flight Refueling, Inc.: *See—*
Graham, Frank C.; and Parker, James T., II, 4,534,384, Cl. 137-899.200.

FMC Corporation: *See—*
Cuhel, Leon L., 4,534,598, Cl. 303-10.000.
Fahmy, Mohamed A. H., 4,535,077, Cl. 514-143.000.
Hopkins, Quentin G.; and Browning, Jhonce N., 4,534,945, Cl. 423-273.000.

Foguet, Rafael: *See—*
Forne , Ernesto; Foguet, Rafael; Sacristan, Aurelio; and Ortiz, Jose A., 4,535,159, Cl. 544-148.000.

Foldesi, Dezso : *See—*
Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , 4,534,782, Cl. 71-21.000.

Ford Motor Company: *See—*
Cederquist, Alf L., 4,535,412, Cl. 364-511.000.
McCabe, Bernard J.; and Courtney, David T., 4,534,717, Cl. 418-181.000.

Forerank, Inc.: *See—*
Summers, David P., 4,534,541, Cl. 251-331.000.

Forne , Ernesto; Foguet, Rafael; Sacristan, Aurelio; and Ortiz, Jose A., to Ferrer Internacional, S.A. Process for producing 1-position amino-derivatives of 1-(3',4'-methylenedioxyphenyl)propane-2-ol. 4,535,159, Cl. 544-148.000.

Forrest, Albert W., Jr., to Du Pont de Nemours, E. I., and Company. Method and apparatus for the electrostatic pinning of polymeric webs. 4,534,918, Cl. 264-22.000.

Forster, Franz, to Linde Aktiengesellschaft. Dual machine aggregates with a connection for a consumer of mechanical energy. 4,534,271, Cl. 91-472.000.

Fortuna, Vincent; and MacLaughlin, Donald, to Cosden Technology, Inc. Thermoplastic container end and method and apparatus for inertial spinwelding of thermoplastic container ends. 4,534,751, Cl. 493-108.000.

Foster, George N.; and Metzler, Richard B., to Union Carbide Corporation. Olefin polymer compositions containing silicone additives and the use thereof in the production of film material. 4,535,113, Cl. 524-262.000.

Fournier, Pierre L. E., to I.C.I. Francolor S.A. Process for the wet granulation of organic pigments in an aqueous system with hydrolysis of acetic anhydride, propionic anhydride or a mixture thereof. 4,535,151, Cl. 534-739.000.

Fox, Charles L., Jr.; and Modak, Shanta M., to Columbia University in the City of New York, The Trustees of. Antibacterial composition comprising silver sulfadiazine and sodium piperacillin. 4,535,078, Cl. 514-157.000.

Fox, Clarence D., to Borg-Warner Corporation. Proportional solenoid valve. 4,534,375, Cl. 137-82.000.

Frankel, Milton B.; and Woolery, Dean O., II, to Rockwell International Corporation. 1-Azidomethyl-3,5,7-trinitro-1,3,5,7-tetrazacycloоctane and synthesis thereof via azidation with acetyl azide. 4,534,895, Cl. 260-239.0BC.

Fransson, Rolf G.: *See—*
Hillstrom, Kennert E. G.; and Fransson, Rolf G., 4,534,631, Cl. 353-95.000.

Frantz, Keith R.; Barnes, Robert A.; and Marks, Bruce G., to RCA Corporation. Resonant degaussing without residual magnetism. 4,535,270, Cl. 315-8.000.

Franz, Michel R.; Vincze, Andreas B.; Lambelin, Georges E.; and Polat, Alain V., to Continental Pharma, Inc. Method for the preparation of p-butoxyphenylacetyl-hydroxamic acid in the finely divided state and a composition containing this acid. 4,534,911, Cl. 514-575.000.

Franz Plasser Bahnbaumasch Ineninustriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,534,689, Cl. 409-296.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,534,295, Cl. 104-7.00B.
Theurer, Josef; and Brunninger, Manfred, 4,534,415, Cl. 171-16.000.

Franzke, Jurgen, to Roscherwerke GmbH. Ham mold closing apparatus. 4,534,286, Cl. 100-219.000.

Fravolini, Arnaldo, to Mediolanum Farmaceutici S.R.L. Alkanolaminoxy derivatives of 3,4-dihydro-2H-1,4-benzothiazin-3-one, their production process, and their pharmaceutical use. 4,535,079, Cl. 514-225.000.

Frazier, Stephen E., to General Time Corp. Air treatment filter element and air treatment filter. 4,534,775, Cl. 55-74.000.

Fredette, Maurice C. J.: *See—*
Rapson, W. Howard; and Fredette, Maurice C. J., 4,534,952, Cl. 423-478.000.

Freeman, Roger K.: *See—*
Boyle, Gerard H.; Freeman, Roger K.; and Goebel, Franz, 4,535,038, Cl. 429-154.000.

Freenor, Francis J., III: *See—*
Luo, Tatao; Russo, Louis; and Freenor, Francis J., III, 4,534,786, Cl. 71-88.000.

Fregeolle, Gerald P.: *See—*
Bush, Thomas J.; Dellinger, Charles L.; and Fregeolle, Gerald P., 4,534,109, Cl. 30-260.000.

Freidinger, Roger M., to Merck & Co. Inc. Chiral, N-protected, N-substituted α-amino acids. 4,535,167, Cl. 548-344.000.

Freling, Martin, to Meyer Label Co., Inc. Composite decorative arrangement with dual adhesive characteristics. 4,535,018, Cl. 428-79.000.

Frenchik, Robert A., to Minnesota Mining and Manufacturing Company. Yellow color formers for use in color photothermographic system. 4,535,056, Cl. 430-542.000.

Fresia, E. James: *See—*
Buczkowski, Gary J.; and Fresia, E. James, 4,535,389, Cl. 361-433.000.

Frey, Sydney W., Jr.; and Herson, Mark I., to Allen-Bradley Company. Natural convection cooling system for electronic components. 4,535,386, Cl. 361-389.000.

Friedrich, Hans-Joachim, to J. F. Adolff AG. Backing mat for a ground covering, preferably for a water-permeable artificial grass, as well as a method for its production. 4,535,021, Cl. 428-137.000.

Friedrich, Wolfgang: *See—*
Hans, Rudiger; Brandenstein, Manfred; Friedrich, Wolfgang; and Haas, Roland, 4,534,749, Cl. 474-174.000.

Frito-Lay, Inc.: *See—*
Kreager, William D.; and Berger, Kenneth R., 4,534,818, Cl. 156-466.000.

Froes, Francis H.: *See—*
Bomberger, Howard B.; and Froes, Francis H., 4,534,938, Cl. 420-590.000.
Eylon, Daniel; and Froes, Francis H., 4,534,808, Cl. 148-133.000.

Froment, Jean-Paul; and Houlon, Louis P. Leveling device for weaving mechanisms incorporating cams of the negative type. 4,534,385, Cl. 139-79.000.

Fuchs, Hermann; and Filzinger, Klaus, to Hoechst Aktiengesellschaft. Water-soluble disazo compounds and new bis-(aminophenoxy)-ethane compounds having fiber-reactive groups as the tetrazo components, and use of the disazo compounds as dyestuffs. 4,534,908, Cl. 260-458.00C.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Abe, Kunihiro; and Morimoto, Yoshihiko, 4,535,289, Cl. 324-208.000.
Takahashi, Toshio, 4,534,214, Cl. 73-118.000.

Fuji Oil Company, Limited: *See—*
Yoshida, Hideaki; and Kubota, Hayato, 4,534,982, Cl. 426-36.000.

Fuji Photo Film Co. Ltd.: *See—*
Arakawa, Satoshi; Nakamura, Takashi; and Takahashi, Kenji, 4,534,884, Cl. 252-301.40H.
Iwakura, Ken; and Ishige, Sadao, 4,535,348, Cl. 346-221.000.
Kawamura, Kouichi; Horie, Seiji; and Sato, Hideo, 4,535,045, Cl. 430-60.000.
Ohara, Yuji; and Horikawa, Kazuo, 4,535,342, Cl. 346-108.000.
Shiota, Kazuo; and Akimoto, Taizo, 4,535,413, Cl. 364-526.000.
Takahashi, Kenji; and Nakamura, Takashi, 4,535,237, Cl. 250-327.200.
Takahashi, Kenji; and Nakamura, Takashi, 4,535,238, Cl. 250-327.200.

Fuji Xerox Co. Ltd.: *See—*
Moriguchi, Haruhiko; Omori, Takashi; and Inui, Toshiharu, 4,535,340, Cl. 346-76.0PH.
Tan, Yoichi, 4,535,450, Cl. 370-94.000.

Fujii, Shigeru: *See—*
Shimizu, Motohiro; and Fujii, Shigeru, 4,535,281, Cl. 322-28.000.

Fujikawa, Motoi, to Aisin Seiki Kabushiki Kaisha. Wheel hub clutch assembly. 4,534,455, Cl. 192-40.000.

Fujimura, Gen; Sotoma, Koichi; Kunikyo, Hiroshi; Hata, Masahito; and Inoue, Hidesuke, to Kewpie Kabushiki Kaisha. High speed egg breaking apparatus. 4,534,284, Cl. 99-498.000.

Fujimura, Takashi; Takahashi, Katsuyu; and Nishizawa, Masahiro, to Hitachi, Ltd. Light exposure apparatus with cooling means. 4,535,234, Cl. 250-238.000.

Fujitsu Limited: *See—*
Nozaki, Shigeki; and Miyahara, Hatsuo, 4,535,423, Cl. 365-51.000.

Tanizawa, Tetsu, 4,535,258, Cl. 307-454.000.
Wakabayashi, Tetsushi; Honda, Norio; and Sakuma, Osamu, 4,535,384, Cl. 361-386.000.
Fujitsu Ten Limited: *See*—
Takayama, Kazuo, 4,535,301, Cl. 330-279.000.
Fujiwara, Chikara: *See*—
Kiyoto, Shinichiro; and Fujiwara, Chikara, 4,534,196, Cl. 72-61.000.
Fukatsu, Shunzo: *See*—
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Wakazawa, Tadashi; Niida, Taro; and Christensen, Burton G., 4,534,898, Cl. 260-245.300.
Fukaya, Chikara: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,534,978, Cl. 514-429.000.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,535,085, Cl. 514-290.000.
Fukuda, Mutsumi: *See*—
Honda, Seiichirou; Ogawara, Hiroshi; and Fukuda, Mutsumi, 4,534,798, Cl. 106-266.000.
Fukuda, Satoru: *See*—
Mimura, Yoshiki; Arai, Tetsuji; Shimizu, Hiroshi; and Fukuda, Satoru, 4,535,228, Cl. 219-411.000.
Fukui, Yoshihiro; Tuchiya, Isamu; and Yoshida, Shun, to Zeon Kosan Co., Ltd. Method for forming tires. 4,534,812, Cl. 156-132.000.
Fukumoto, Hiroshi: *See*—
Inoue, Sukejiro; Sasakawa, Masumi; Fukumoto, Hiroshi; and Doi, Shinji, 4,535,048, Cl. 430-110.000.
Fukunaga, Tokio: *See*—
Kiso, Mataichiro; Futakawa, Akemi; and Fukunaga, Tokio, 4,534,206, Cl. 73-12.000.
Fulguvit GmbH & Co. K.G.: *See*—
Reinlein, Karl-Heinz; and Stablein, Bruno, 4,534,311, Cl. 118-630.000.
Fuller Company: *See*—
Courtay, Robert Y., 4,534,653, Cl. 366-106.000.
Fung, Anthony K., to Sperry Corporation. Circular-queue structure. 4,535,420, Cl. 364-900.000.
Funk, David B.; and Kallmeyer, James B., to Dickey-john Corporation. Method and apparatus for preparing a meat sample for determination of composition of same. 4,534,229, Cl. 73-863.000.
Furman, Anatol, to International Business Machines Corporation. Multi-port register implementations. 4,535,428, Cl. 365-230.000.
Furst, Sidney M.: *See*—
Williamson, Robert D.; and Furst, Sidney M., 4,534,813, Cl. 156-212.000.
Furukawa, Osamu: *See*—
Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; and Furukawa, Osamu, 4,535,314, Cl. 338-21.000.
Furukawa, Tatsuya: *See*—
Horike, Masanori; Furukawa, Tatsuya; Ebi, Yutaka; and Yamazaki, Hiroshi, 4,535,339, Cl. 346-75.000.
Fushimoto, Hideo: *See*—
Kano, Kuniomi; Fushimoto, Hideo; Sekine, Kazumi; Miyagawa, Akira; Hirata, Osamu; and Nishimuro, Yoshiaki, 4,535,416, Cl. 364-715.000.
Fussl, Erwin; and Ranner, Max, to Maerz Ofenbau AG. Process and apparatus for calcining limestone. 4,534,731, Cl. 432-14.000.
Futaba Denshi Kogyo K.K.: *See*—
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,535,195, Cl. 136-261.000.
Futakawa, Akemi: *See*—
Kiso, Mataichiro; Futakawa, Akemi; and Fukunaga, Tokio, 4,534,206, Cl. 73-12.000.
G. D. Societa' per Azioni: *See*—
Seragnoli, Enzo, 4,534,253, Cl. 83-336.000.
G & H Montage GmbH: *See*—
Kuckein, Wilfried; Mylius, Albert; Bechtel, Peter; and Hofer, Adalbert, 4,535,017, Cl. 428-77.000.
Gagas, Michael S.; and Gagas, Stanley J., to Adaptor, Inc. Gate valve adaptor. 4,534,378, Cl. 137-367.000.
Gagas, Stanley J.: *See*—
Gagas, Michael S.; and Gagas, Stanley J., 4,534,378, Cl. 137-367.000.
Gale, Michael T.; and Lehmann, Hans W., to RCA Corporation. Standardized multi-stack dielectric-layer filter blank and method for fabricating color-encoding filter therefrom. 4,534,620, Cl. 350-166.000.
Galiotto, Bruno R.: *See*—
Bonetta, Angelo A.; and Galiotto, Bruno R., 4,534,365, Cl. 128-779.000.
Galliani, Giulio; Omodei-Sale, Amedeo; Consonni, Pietro; and Assandri, Alessandro, to Gruppo Lepetit S.p.A. 3,5-Diphenyl-1H-1,2,4-triazoles pharmaceutical compositions and uses. 4,535,090, Cl. 514-383.000.
Gans, Karl: *See*—
Bung, Richard; Gans, Karl; Schreyer, Gerold; and Welzel, Gerhard, 4,534,720, Cl. 425-7.000.
Garcia, Frank, Jr.; and Brown, David L., to Vetco Offshore, Inc. Valve seat with trapped O-ring. 4,534,096, Cl. 29-157.10R.
Gardner, Gary M.; and Semple, J. Edward, to Shell Oil Company. N-L-seryl-3-azetidinecarboxylic acid. 4,534,787, Cl. 71-88.000.
Gardner, Nigel C.: *See*—
Jenkins, James O. M.; and Gardner, Nigel C., 4,535,203, Cl. 179-81.00R.
Garrison, Lee E.: *See*—
Heck, Samuel C.; and Garrison, Lee E., 4,534,669, Cl. 401-134.000.
Garrocho, Jose M. Miniature pneumatic punch. 4,534,250, Cl. 83-98.000.
Gasau, Jacob, to Nestec S.A. Continuous extraction process. 4,534,985, Cl. 426-432.000.
Gason Energy Engineering Ltd.: *See*—
Kogan, Abraham; and Moore, Uri, 4,534,175, Cl. 60-649.000.
Gates Rubber Company, The: *See*—
Stieg, Richard F., 4,534,232, Cl. 74-89.200.
Stieg, Richard F.; Dolan, John P.; Worley, W. Spencer; and Gerbert, Goran, 4,534,748, Cl. 474-17.000.
Gates, William J.; and Zwirlein, John F., to Olin Corporation. Air purge/solvent bath method. 4,534,802, Cl. 134-22.120.
Gaubert, Rene J. Method and machine for filling bags with liquid. 4,534,154, Cl. 53-458.000.
Geary, Frederick J., to Robertshaw Controls Company. Ignition system. 4,535,380, Cl. 361-256.000.
Gebr. Happich GmbH: *See*—
Dietz, Gunter; and Flagmeyer, Friedhelm, 4,534,240, Cl. 74-545.000.
Geib, Lawrence: *See*—
Brown, Vincent B.; and Geib, Lawrence, 4,534,603, Cl. 339-17.00C.
Geller, Leo, to ALZA Corporation. Device for releasing active ingredient, insertable in a system of parenteral administering the ingredient. 4,534,757, Cl. 604-85.000.
Gellman, Gary; Erfurt, George A.; and Roe, James E., to Nabisco Brands, Inc. Soft canine biscuit containing discrete meat and/or meat by-product particles and method for making same. 4,534,989, Cl. 426-549.000.
Gellman, Gary; Erfurt, George A.; and Roe, James E., to Nabisco Brands, Inc. Soft canine biscuit containing discrete particles of meat and other materials and method for making same. 4,534,990, Cl. 426-549.000.
Genentech, Inc.: *See*—
Johnston, Paul D., 4,534,906, Cl. 260-112.00R.
General Battery Corporation: *See*—
Eberle, William J., 4,534,549, Cl. 271-103.000.
General Dynamics Corporation/Convair Div.: *See*—
Carlson, Ronald F., 4,534,682, Cl. 408-14.000.
General Electric Company: *See*—
Abolins, Visvaldis; and Holub, Fred F., 4,535,106, Cl. 524-151.000.
Arendt, Ronald H.; and Pasco, Wayne D., 4,534,956, Cl. 423-598.000.
Cho, Hyun S., 4,534,934, Cl. 419-6.000.
Crivello, James V., 4,535,174, Cl. 556-443.000.
Davis, L. Berkley, Jr.; Hilt, Milton B.; and Wilkes, Colin, 4,534,165, Cl. 60-39.020.
Farrall, George A., 4,534,741, Cl. 445-3.000.
Itani, Abdallah M., 4,535,400, Cl. 363-68.000.
Lane, Lawrence J., 4,535,377, Cl. 361-1.000.
Mark, Victor; and Hedges, Charles V., 4,535,191, Cl. 568-727.000.
Milkovic, Miran, 4,535,287, Cl. 324-142.000.
Miller, Edward B.; and Eichelberger, Charles W., 4,535,332, Cl. 340-825.060.
Miller-Jones, Stockton M.; and Flax, Stephen W., 4,534,359, Cl. 128-660.000.
Puckette, Charles M., 4,535,297, Cl. 329-126.000.
Pyles, Robert A., 4,535,104, Cl. 524-91.000.
Rose, Leonard, 4,534,226, Cl. 73-861.840.
Rosenquist, Niles R.; and Tyrell, John A., 4,535,108, Cl. 524-162.000.
Sakash, George; Grier, Robert K., Jr.; Stern, Hansjoerg; Dada, Abdul G.; and McKeel, Daniel W., 4,534,301, Cl. 110-255.000.
Stocking, George E.; and Pohl, Walter J., 4,534,179, Cl. 62-128.000.
Tomich, Michael J., 4,534,698, Cl. 415-9.000.
Tschetter, Charles D.; and Bergman, Rolf S., 4,535,269, Cl. 313-579.000.
West, Paul R.; and Griffing, Bruce F., 4,535,053, Cl. 430-312.000.
General Foods Corporation: *See*—
Zanno, Paul R.; and Parliment, Thomas H., 4,534,988, Cl. 426-535.000.
General Instrument Corp.: *See*—
Meloni, Robert A., 4,534,287, Cl. 101-93.050.
General Kinematics Corporation: *See*—
Kraus, Richard B., 4,534,730, Cl. 432-3.000.
General Motors Corporation: *See*—
Fannin, Wayne V.; and Pees, James M., 4,534,545, Cl. 267-64.240.
Kline, Richard H., 4,534,091, Cl. 29-2.000.
Kline, Richard H., 4,535,040, Cl. 429-234.000.
General Packaging Equipment Company: *See*—
Kelly, Robert C., 4,534,159, Cl. 53-552.000.
General Signal Corporation: *See*—
Wright, Eric C.; and Fairman, Ronald E., 4,534,599, Cl. 303-22.00R.
General Time Corp.: *See*—
Frazier, Stephen E., 4,534,775, Cl. 55-74.000.
General Tire & Rubber Company, The: *See*—
Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, 4,534,888, Cl. 252-511.000.
George, Peter K.: *See*—
Mowry, Gregory S; and George, Peter K., 4,535,375, Cl. 360-113.000.

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Grossman, Mark W.; George, William A.; and Pai, Robert Y., 4,534,742, Cl. 445-9.000.

Geoscience Ltd: *See—*
Poppendiek, Heinz F.; and Sabin, Cullen M., 4,534,663, Cl. 374-43.000.

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Bricot, Claude; Gerard, Jean Louis; and Audoin, Michel, 4,535,431, Cl. 369-44.000.

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Stieg, Richard F.; Dolan, John P.; Worley, W. Spencer; and Gerbert, Goran, 4,534,748, Cl. 474-17.000.

Gerik, Bernard J.: *See—*
Walter, Robert J.; and Gerik, Bernard J., 4,534,794, Cl. 106-14.050.

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Clerget, Michel; Germain, Francois; Kryze, Jiri; and Poujois, Robert, 4,534,650, Cl. 356-376.000.

Gero, Gary: *See—*
Bogle, Robert W.; and Gero, Gary, 4,534,629, Cl. 352-140.000.

Gerot, Guy J. C., to U.S. Philips Corporation. Method of transferring data in a television receiver. 4,535,362, Cl. 358-194.100.

Gervais, William J., to Rosstream Research Assoc. Ltd. Magnetic tape reel write protect mechanism. 4,535,370, Cl. 360-60.000.

Gettig, William A.; and Fetterolf, Gerald S. Hypodermic cartridge. 4,534,763, Cl. 604-239.000.

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Weirich, Walter; Melis, Jurgen; and Wollenhaupt, Peter, 4,534,584, Cl. 285-24.000.
Weirich, Walter; and Dettmers, Michael, 4,534,681, Cl. 405-294.000.

Geyer, Roger D.: *See—*
Peacock, Bobbie D.; Mushovic, John N.; and Geyer, Roger D., 4,534,225, Cl. 73-860.000.

Giebeler, Robert H., Jr.: *See—*
Wedemeyer, Robert C.; and Giebeler, Robert H., Jr., 4,534,861, Cl. 210-168.000.

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Sirinyan, Kirkor; Merten, Rudolf; and Giesecke, Henning, 4,535,032, Cl. 428-629.000.

Gilbert, Everett E.: *See—*
Sollott, Gilbert P.; and Gilbert, Everett E., 4,535,193, Cl. 568-941.000.

Gilker, Clyde: *See—*
Jindrick, James A.; Dolnik, Thomas G.; Nohria, Naresh K.; Gilker, Clyde; Hurley, James R.; Dunk, Michael P.; Reis, Norbert J.; and Bray, Thomas J., 4,535,409, Cl. 364-481.000.

Gilliland, James L., Jr.: *See—*
Toub, Samuel G.; Gilliland, James L., Jr.; and Holder, Homer W., 4,534,182, Cl. 62-193.000.

Gilliland, W. Keith; Hart, Lawrence M.; and Nesta, Charles, to Xerox Corporation. Charge erase device for copying or reproduction machines and printers. 4,534,641, Cl. 355-3.00R.

Gillmor, Richard H., to Gillmor, Richard H.; and Wise, Benjamin W. Geometric air projection and containment. 4,534,277, Cl. 98-36.000.

Gilman, Harry. Check-out counter divider. 4,534,126, Cl. 40-19.000.

Giordano, Claudio: *See—*
Castaldi, Graziano; and Giordano, Claudio, 4,535,166, Cl. 548-204.000.

Giravions Dorand: *See—*
Allard, Jean-Claude; Briard, Rene; and Saunier, Christian, 4,534,735, Cl. 434-20.000.

Gjertsen, Robert K.; and Veronesi, Luciano, to Westinghouse Electric Corp. Nuclear reactor fuel assembly with improved top nozzle and hold-down means. 4,534,933, Cl. 376-364.000.

Gladfelter, Elizabeth J.; Rogier, Edgar R.; and DiDomenico, Edward D., to Henkel Corporation. Polyglycidyl ethers of tricyclodecane and cured epoxy resins therefrom. 4,535,148, Cl. 528-365.000.

Gladky, Petr V.: *See—*
Bragin, Boris F.; Kolomiets, Alexandr S.; Korotkikh, Jury B.; Markuntovich, Felix D.; Olofinsky, Evgeny P.; Gladky, Petr V.; Perepletchikov, Evgeny F.; and Ekber, Boris Y., 4,534,540, Cl. 251-203.000.

Glance, Bernard: *See—*
Cho, Alfred Y.; Glance, Bernard; Lubzens, Daniel; and Schneider, Martin V., 4,534,103, Cl. 29-571.000.

Glanz, Kenneth D., to Appleton Papers Inc. Thermally-responsive record material. 4,535,347, Cl. 346-208.000.

Glaser, Herbert; and Stolzenberg, Konrad, to Rutgerswerke Aktiengesellschaft. Process for the manufacture of molded carbon bodies. 4,534,949, Cl. 423-445.000.

Glass, Henry P., to Mall, David. Triple-edge safety razor and blade. 4,534,110, Cl. 30-346.570.

Glatt GmbH: *See—*
Naunapper, Dietmar; and Braun, Gunter, 4,535,006, Cl. 427-213.000.

Glicksman, Leon R., to Massachusetts Institute of Technology. Apparatus and method for drying insulation. 4,534,119, Cl. 34-95.000.

Glinka, John; and Fish, Leonard A., to Casino Technology. Dispensing machine with removable dispensing unit. 4,534,373, Cl. 133-5.00R.

Glover, Douglas W.: *See—*
Bowen, Terry P.; Caron, Bernard G.; Cooper, Ronald F.; and Glover, Douglas W., 4,534,616, Cl. 350-96.200.

Glover, Richard W.: *See—*
Mitchell, Hal D.; Glover, Richard W.; Walker, Donald R.; and Rosenberg, Isadore, 4,534,068, Cl. 2-414.000.

GNB Batteries Inc.: *See—*
Schaumburg, Edward G.; Benson, Cory D.; Wolf, Alby H.; and Zais, Michael G., 4,534,401, Cl. 164-102.000.

Goebel, Franz: *See—*
Boyle, Gerard H.; Freeman, Roger K.; and Goebel, Franz, 4,535,038, Cl. 429-154.000.

Goetzen, Thomas: *See—*
Golec, Frederick A., Jr.; and Goetzen, Thomas, 4,535,177, Cl. 560-38.000.

Goines, Fredrick J.; and Reifsteck, David A., to Midwest Irrigation and Foundation, Inc. System for controlling the moisture in the subsurface soil surrounding a building. 4,534,143, Cl. 52-169.500.

Goko, Nobuaki; and Uehara, Yumito, to Mitsubishi Chemical Industries, Ltd. Process for preparing solid titanium trichloride useful for the polymerization of an α-olefin. 4,534,953, Cl. 423-492.000.

Gold Bond Ice Cream, Inc.: *See—*
Lutsey, Thomas H.; and Bero, Vernon L., 4,534,722, Cl. 425-104.000.

Gold, Philip, to Cordis Corporation. Coating for angiographic guidewire. 4,534,363, Cl. 128-772.000.

Goldelius, Rainer, to Black & Decker Inc. Electric tool with torque monitor. 4,534,420, Cl. 173-12.000.

Golden, Donald M.; and McVay, William P., to Ethicon, Inc. Two-piece tissue fastener with compressible leg staple and retaining receiver. 4,534,350, Cl. 128-334.00C.

Gole, Francois V.: *See—*
Rocroi, Jean-Pierre C.; and Gole, Francois V., 4,535,293, Cl. 324-336.000.

Golec, Frederick A., Jr.; and Goetzen, Thomas, to USV Pharmaceutical Corp. N-substituted amino acid derivatives. 4,535,177, Cl. 560-38.000.

Golikova, Galina M.: *See—*
Rabinovich, Lev M.; Jurovsky, Albert Y.; Brodkin, Jury M.; Puginsky, Viktor A.; Iordan, Georgy G.; Serdjukov, Vilen I.; Sukhodolets, Vadim K.; Tikhnova, Galina V.; and Golikova, Galina M., 4,535,283, Cl. 323-365.000.

Golubev, Vladimir N.: *See—*
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; Karavaev, Alexandr A.; and Yakushev, Vladimir M., 4,534,348, Cl. 128-305.000.

Gombar, Mihaly: *See—*
Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , 4,534,782, Cl. 71-21.000.

Goodman, Joseph J.: *See—*
Labeda, David P.; Goodman, Joseph J.; Borders, Donald B.; Testa, Raymond T.; and Martin, John H. E. J., deceased, 4,534,970, Cl. 424-122.000.

Goodman, Sidney J.: *See—*
Chow, Ho; and Goodman, Sidney J., 4,534,512, Cl. 239-394.000.

Goodrich, Gary B.; and Belani, Jadish G., to National Semiconductor Corporation. Low-cost semiconductor device package and process. 4,535,350, Cl. 357-74.000.

Goodyear Tire & Rubber Company, The: *See—*
Bonko, Mark L.; and Lopp, Loran C., Jr., 4,534,392, Cl. 152-209.00B.
Kaniecki, Michael; Landers, Samuel P.; and Botzman, Thomas J., 4,535,114, Cl. 524-364.000.
Pengilly, Brian W., 4,535,118, Cl. 524-398.000.

Gordon, Eric M.: *See—*
Natarajan, Sesha I.; and Gordon, Eric M., 4,535,176, Cl. 560-27.000.

Gordon, Philip J., to Chesebrough-Pond's Inc. High pearlescent pressed powder eye shadow composition. 4,534,963, Cl. 424-69.000.

Gordon, Roy G. Chemical vapor deposition of titanium nitride and like films. 4,535,000, Cl. 427-160.000.

Gornall, Graham J.: *See—*
Price, Anthony G.; and Gornall, Graham J., 4,534,172, Cl. 60-578.000.

Gosudarstvenny Nauchno-Issledovatelsky Institut Teploenergeticheskogo Priborostroenia: *See—*
Rabinovich, Lev M.; Jurovsky, Albert Y.; Brodkin, Jury M.; Puginsky, Viktor A.; Iordan, Georgy G.; Serdjukov, Vilen I.; Sukhodolets, Vadim K.; Tikhnova, Galina V.; and Golikova, Galina M., 4,535,283, Cl. 323-365.000.

Goth, George R.; Hansen, Thomas A.; and Villetto, Robert T., Jr., to International Business Machines Corporation. Trench etch process for dielectric isolation. 4,534,826, Cl. 156-643.000.

Gotze, Thomas: *See—*
Dorries, Peter; Gotze, Thomas; Piesch, Steffen; Schon, Manfred; Wulff, Gunther; Hintermeier, Karl; Wulff, Gunther; and Hintermeier, Karl, 4,535,031, Cl. 428-481.000.

Gouilloud, Michel: *See—*
Sinha, Bikash K.; and Gouilloud, Michel, 4,534,223, Cl. 73-703.000.

Graciet, Michel: *See—*
Hareng, Michel; Perbet, Jean-Noel; and Graciet, Michel, 4,535,327, Cl. 340-719.000.

Grafton Limited: *See—*
Bury, John E., 4,534,667, Cl. 400-207.000.

Graham, Frank C.; and Parker, James T., II, to Flight Refueling, Inc. Reel system for axially extending hose. 4,534,384, Cl. 137-899.200.

Graham, James T.; and Johnson, Gerald E., to Lamb Technicon Corp. Chain-driven pocket elevator. 4,534,460, Cl. 198-482.000.

Grant, George G.: *See—*
Woyton, Joseph T.; and Grant, George G., 4,534,114, Cl. 33-181.00R.

Grasset, Daniel; and Martinot, Bernard, to Societe Chimique des Charbonnages–CdF CHIMIE. Apparatus for reducing the chances of ignition and explosion from the decomposition of high-pressure industrial process ethylene gases. 4,534,942, Cl. 422-117.000.

Grau, Werner: *See—*
Roller, Hermann; Lehner, August; Hack, Joachim; Grau, Werner; Balz, Werner; and Baur, Reinhold, 4,534,999, Cl. 427-130.000.

Gravity Guidance, Inc.: *See—*
Miller, Jack V., 4,534,554, Cl. 272-144.000.

Grawey, Charles E., to Caterpillar Tractor Co. Wheel assembly having self-contained tire mounting capability. 4,534,394, Cl. 152-396.000.

Gray, Joseph L., to Gray Manufacturing Company, Inc. Method of elevating a four wheel vehicle utilizing a tiltable support stand. 4,534,543, Cl. 254-1.000.

Gray Manufacturing Company, Inc.: *See—*
Gray, Joseph L., 4,534,543, Cl. 254-1.000.

Gray Tool Company: *See—*
Mitcham, John P.; and Karr, Michael A., Jr., 4,534,235, Cl. 74-128.000.

Green Cross Corporation, The: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,534,978, Cl. 514-429.000.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,535,085, Cl. 514-290.000.

Greener, Brian H., to Plibrico Limited. Refractory plastic gunning. 4,535,001, Cl. 427-180.000.

GRETAG Aktiengesellschaft: *See—*
Ehrat, Kurt, 4,534,195, Cl. 70-316.000.

Griat, Jacqueline: *See—*
Zabotto, Arlette; and Griat, Jacqueline, 4,534,981, Cl. 514-783.000.

Grier, Robert K., Jr.: *See—*
Sakash, George; Grier, Robert K., Jr.; Stern, Hansjoerg; Dada, Abdul G.; and McKeel, Daniel W., 4,534,301, Cl. 110-255.000.

Griffing, Bruce F.: *See—*
West, Paul R.; and Griffing, Bruce F., 4,535,053, Cl. 430-312.000.

Groh, Edward F.: *See—*
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Gross, Valery N.; and Stupnik, Vyacheslav D., to Institut Molekulyarnoi Biologii Biokhimii Akademii Nauk Kazakhskoi SSR. Apparatus for photometrically scanning gels. 4,534,647, Cl. 356-344.000.

Grossman, Mark W.; George, William A.; and Pai, Robert Y., to GTE Products Corporation. Method and apparatus for dispensing small quantities of mercury from evacuated and sealed glass capsules. 4,534,742, Cl. 445-9.000.

Grove, John L.; Hockensmith, John L.; and Coffman, Allen B., to JLG Industries, Inc. Vehicle suspension and steerage system. 4,534,575, Cl. 280-6.110.

Groves, Michael R.; and Rodriguez, Carlos M., to Coulter Electronics, Inc. High and low frequency analysis of osmotic stress of cells. 4,535,284, Cl. 324-71.100.

Grow, Arthur L.: *See—*
Hemmelgarn, Donald J.; and Grow, Arthur L., 4,534,725, Cl. 425-394.000.

Grudzinskas, Charles V.; and Weiss, Martin J., to American Cyanamid Company. 11-Deoxy-11-substituted prostaglandins of the E and F series. 4,535,180, Cl. 560-121.000.

Gruppo Lepetit S.p.A.: *See—*
Galliani, Giulio; Omodei-Sale, Amedeo; Consonni, Pietro; and Assandri, Alessandro, 4,535,090, Cl. 514-383.000.

GTE Communications Products Corporation: *See—*
Boyle, Gerard H.; Freeman, Roger K.; and Goebel, Franz, 4,535,038, Cl. 429-154.000.

GTE Products Corporation: *See—*
Grossman, Mark W.; George, William A.; and Pai, Robert Y., 4,534,742, Cl. 445-9.000.
Morris, Merle E.; Meade, Steven L.; and Rice, Lawrence M., 4,535,268, Cl. 313-569.000.

Guenther, Geoffrey L. Three dimensional puzzle. 4,534,563, Cl. 273-157.00R.

Gueremy, Claude G. A.: *See—*
Audiau, Francois; Gueremy, Claude G. A.; and Le Fur, Gerard R., 4,535,080, Cl. 514-255.000.

Guha, Probir K.: *See—*
Iseler, Kenneth A.; Guha, Probir K.; and Yen, Robert C., 4,535,110, Cl. 524-196.000.

Guibet, Jean P.: *See—*
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Guild Associates, Inc.: *See—*
Schlaechter, John, 4,534,346, Cl. 128-205.120.

Guillou, Denis: *See—*
Ravinet, Pierre; Claudepierre, Christian; Guillou, Denis; and Micheron, Francois, 4,535,205, Cl. 179-110.00A.

Guinosso, Charles J., to American Home Products Corporation. Preparation of indoline-2-carboxylic acid via the intermediate indoline-2-carboxylic acid ester tin complex. 4,535,168, Cl. 548-402.000.

Gulf Oil Corporation: *See—*
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Gustafsson, Bert; and Strang, Hans-Erik. Underground bomb shelter/storage celler unit. 4,534,144, Cl. 52-169.600.

Guthrie, Don W., to Aerospace Optics, Inc. Sunlight readable illuminated indicia display devices. 4,535,396, Cl. 362-293.000.

Haas, Franz; Janisch, Gerhard; and Schreyer, Gerold, to BASF Aktiengesellschaft. Consolidating the surface of a granular adsorbent. 4,535,004, Cl. 427-212.000.

Haas, Franz; Janisch, Gerhard; and Schreyer, Gerold, to BASF Aktiengesellschaft. Consolidating the surface of a granular adsorbent. 4,535,005, Cl. 427-212.000.

Haas, Hans: *See—*
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Haas, Roland: *See—*
Hans, Rudiger; Brandenstein, Manfred; Friedrich, Wolfgang; and Haas, Roland, 4,534,749, Cl. 474-174.000.

Habib, Wagdi W., to Hollister Incorporated. Protective sealing composition in molded form. 4,534,767, Cl. 604-336.000.

Hack, Joachim: *See—*
Roller, Hermann; Lehner, August; Hack, Joachim; Grau, Werner; Balz, Werner; and Baur, Reinhold, 4,534,999, Cl. 427-130.000.

Haefner, LeRoy H.; and Rhodes, Stephen M., to Macklanburg-Duncan Company. Spirit level. 4,534,117, Cl. 33-379.000.

Haeger, Bruce E., to American Cyanamid Company. Composition of matter comprising a low bulk density lyophilized preparation of Sodium Piperacillin. 4,534,977, Cl. 514-196.000.

Hafner, Rainer. Holder with a stack of sheets. 4,534,671, Cl. 402-80.00R.

Haguchi, Hiroshi: *See—*
Iwasaki, Shigeo; and Haguchi, Hiroshi, 4,534,721, Cl. 425-73.000.

Hajj Chehade, Mohammed; Lecat, Jean; and Tartois, Claude, to U.S. Philips Corporation. FM-Demodulator with ladder filter delay line and multiplier. 4,535,296, Cl. 329-103.000.

Halcon SD Group, Inc., The: *See—*
Khoobiar, Sargis, 4,535,188, Cl. 568-479.000.

Haley, Timothy P.: *See—*
Rosanes, Albert; and Haley, Timothy P., 4,535,447, Cl. 370-77.000.

Hall, John B.; and Yoshida, Takao, to International Flavors & Fragrances Inc. Tertiary pentamethylindanol derivatives and organoleptic uses thereof. 4,535,192, Cl. 568-819.000.

Hamada, Minoru: *See—*
Matsuzaki, Kazuhiko; and Hamada, Minoru, 4,535,127, Cl. 525-154.000.

Hamada, Mitsuo; and Yasuda, Sadami, to Toray Silicone Co., Ltd. Adhesive primer composition and bonding method employing same. 4,534,815, Cl. 156-307.500.

Hamaguchi, Osamu, to Nippon Cable System Inc. Wire-driving device for window regulator. 4,534,233, Cl. 74-89.200.

Hampson Enterprises, Inc.: *See—*
Hampson, Herbert, 4,534,083, Cl. 15-321.000.

Hampson, Herbert, to Hampson Enterprises, Inc. Control valve assembly. 4,534,083, Cl. 15-321.000.

Hanau, Fernand. Bacon slicing machine. 4,534,548, Cl. 270-58.000.

Handa, Ryoji; Hosoda, Jun; and Yoshida, Norimasa, to Nitto Kagaku Kabushiki Kaisha; Mitsubishi Rayon Co., Ltd.; and Diafloc Co., Ltd. Process for producing partially hydrolyzed acrylamide polymer. 4,535,131, Cl. 525-369.000.

Hanna, Marie R.: *See—*
Boden, Richard M.; Temes, Steven D.; Tyszkiewicz, Theodore J.; and Hanna, Marie R., 4,534,891, Cl. 252-522.00R.

Hans, Rudiger; Brandenstein, Manfred; Friedrich, Wolfgang; and Haas, Roland, to SKF GmbH. Pulley. 4,534,749, Cl. 474-174.000.

Hanseler, Urs; Meier, Urs; and Muther, Franz, to Contraves AG. Guide rail for electronic module supports. 4,534,472, Cl. 211-41.000.

Hansen, Helge; Nystrom, Borje; and Torneng, Eyvin, to International Flavors & Fragrances Inc. Method and means for repelling animals. 4,534,976, Cl. 514-169.000.

Hansen, Thomas A.: *See—*
Goth, George R.; Hansen, Thomas A.; and Villetto, Robert T., Jr., 4,534,826, Cl. 156-643.000.

Hansson, Erik. Glove. 4,534,066, Cl. 2-163.000.

Harada, Nozomu; Oana, Yasuhisa; Ogi, Keisuke; Izawa, Koji; Taya, Akira; and Sakamoto, Masanori, to Tokyo Shibaura Denki Kabushiki Kaisha. Solid-state device having a plurality of optical functions. 4,534,622, Cl. 350-334.000.

Harada, Nozomu; and Yoshida, Okio, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic image sensing apparatus. 4,535,363, Cl. 358-213.000.

Harada, Tuneo: *See—*
Oyama, Kiyotaka; and Harada, Tuneo, 4,534,909, Cl. 260-465.00G.

Harbert, Charles A.: *See—*
Lombardino, Joseph G.; and Harbert, Charles A., 4,535,084, Cl. 514-277.000.

Hareng, Michel; Perbet, Jean-Noel; and Graciet, Michel, to Thomson-CSF. Electrically controlled display using a thick layer, non-linear element and its production process. 4,535,327, Cl. 340-719.000.

Hareyama, Kyuichi, to Nippon Electric Co., Ltd. Comparator circuit. 4,535,257, Cl. 307-362.000.

Hargrove, William W.: *See—*
Akers, Michael J.; Hargrove, William W.; Harris, Dale C.; and Sperry, Charles R., 4,534,758, Cl. 604-85.000.

Harr, Jerome D.; and Hense, Karl R., to International Business Machines Corporation. Recording channel with signal controlled integrated analog circuits. 4,535,371, Cl. 360-67.000.

Harriett, Todd D., to American Colloid Company. Uninhibited bentonite composition. 4,534,925, Cl. 264-281.000.

Harriett, Todd D., to American Colloid Company. Uninhibited bentonite composition. 4,534,926, Cl. 264-281.000.

Harrington, Timothy C.; and Horsley, John K., to Molins PLC. Ledger for cut-off devices in cigarette machines. 4,534,252, Cl. 83-310.000.

Harris, Dale C.: *See*—
Akers, Michael J.; Hargrove, William W.; Harris, Dale C.; and Sperry, Charles R., 4,534,758, Cl. 604-85.000.
Harris Graphics Corporation: *See*—
Brovman, Yakov Z., 4,534,288, Cl. 101-211.000.
Harris, Ralph A.: *See*—
Streckmann, George L.; and Harris, Ralph A., 4,535,299, Cl. 330-279.000.
Harris, Richard D.: *See*—
Hoover, Alan A.; and Harris, Richard D., 4,534,462, Cl. 198-781.000.
Harshbarger, Harry F.; Kurz, John L.; and Young, Patrick J., to JGR Enterprises, Inc. Security door. 4,534,192, Cl. 70-118.000.
Hart, Lawrence M.: *See*—
Gilliland, W. Keith; Hart, Lawrence M.; and Nesta, Charles, 4,534,641, Cl. 355-3.00R.
Hartig, Klaus; Dietrich, Anton; and Scherer, Michael, to Leybold-Heraeus GmbH. Solar controlled glazing and method of producing glazing. 4,534,841, Cl. 204-192.00P.
Hartmann, Werner: *See*—
Ahrweiler, Karl-Heinz; Anstotz, Helmut; and Hartmann, Werner, 4,534,829, Cl. 162-361.000.
Harvest, Nils-Ole; and Melamed, Anna, to Danfoss A/S. Stabilizing circuit for an inverse rectifier motor control. 4,535,280, Cl. 318-798.000.
Harvill, John I. Hot chamber die casting machine. 4,534,403, Cl. 164-316.000.
Hashimoto, Masahide; Kurisu, Yoshitaka; Zuiki, Shigeo; and Sasaki, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Continuous freezing apparatus. 4,534,183, Cl. 62-374.000.
Hashizume, Iwao. Dynamic separator for a grinding mill. 4,534,516, Cl. 241-171.000.
Haskell, Barin G., to AT&T Bell Laboratories. Technique for generating semi-compatible high definition television signals for transmission over two cable TV channels. 4,535,352, Cl. 358-16.000.
Hasting, Anthony P. M., to APV International Limited. High-temperature treatment of liquids. 4,534,986, Cl. 426-521.000.
Hata, Masahito: *See*—
Fujimura, Gen; Sotoma, Koichi; Kunikyo, Hiroshi; Hata, Masahito; and Inoue, Hidesuke, 4,534,284, Cl. 99-498.000.
Hattori, Katsuhide: *See*—
Takeuchi, Fumio; Takahashi, Masao; Hattori, Katsuhide; and Sakai, Hiroshi, 4,534,809, Cl. 149-3.000.
Hattori, Takemi, to Aisin Seiki Kabushiki Kaisha. Lumbar support adjusting apparatus. 4,534,592, Cl. 297-284.000.
Hattori, Yoshio: *See*—
Suzuki, Isamu; and Hattori, Yoshio, 4,535,274, Cl. 318-254.000.
Hauptmann, Michael C.; and Russomanno, Charles G., to Block Drug Company, Inc. Automatic toilet bowl cleaner and depletion signal. 4,534,070, Cl. 4-228.000.
Hausinger, Otto, to Dr. Ing. h.c.F. Porsche A.G. Coupling for the detachable connection of a subdivided drive shaft of a motor vehicle. 4,534,746, Cl. 464-170.000.
Hautemont, Jean-Claude H., to Societe Anonyme dite: Etude de Realisation de Chaines Automatiques ERCA. Cleaning system for filler. 4,534,494, Cl. 222-148.000.
Hawkins, Geoffrey R.: *See*—
Herstein, Morris S.; Smith, Walter P.; and Hawkins, Geoffrey R., 4,534,964, Cl. 424-70.000.
Hawley, Floyd E.: *See*—
Jahnke, William R.; Rockel, Bruce H.; Brown, Barry J.; Hawley, Floyd E.; Pennella, Andrew J.; Sugrue, John C.; and Wiggins, William R., 4,534,093, Cl. 29-26.00A.
Hawley, Gil R.: *See*—
McDaniel, Max P.; Johnson, Marvin M.; Hawley, Gil R.; Westerman, John; and Smith, Paul D., 4,535,070, Cl. 502-208.000.
Hay, Robert R.: *See*—
Wright, Conrad L.; Bearrs, James G.; Chan, C. S.; Hay, Robert R.; and Ura, Frank, 4,535,343, Cl. 346-140.00R.
Hayakawa, Isao, to Daiichi Seiyaku Co., Ltd. Benzoquinoiizine derivatives. 4,535,161, Cl. 546-94.000.
Hazeltine Corporation: *See*—
Rosanes, Albert; and Haley, Timothy P., 4,535,447, Cl. 370-77.000.
Heberlein, Werner: *See*—
von Laar, Klaus; Heberlein, Werner; and Burda, Josef, 4,534,294, Cl. 102-520.000.
Heck, Samuel C.; and Garrison, Lee E., to Sani-Fresh International, Inc. Cleaning system with cartridge having valve means. 4,534,669, Cl. 401-134.000.
Hedges, Charles V.: *See*—
Mark, Victor; and Hedges, Charles V., 4,535,191, Cl. 568-727.000.
Hegemann, Fritz; and Beihammer, Horst, to Krupp Bruninghaus GmbH. Spring teeth. 4,534,418, Cl. 172-708.000.
Heide, Carsten, to American Microsystems, Inc. Lift. 4,534,544, Cl. 254-9.00C.
Heidelberger Druckmaschinen AG: *See*—
Durrnagel, Klaus; Jeschke, Willi; and Jahn, Hans-Georg, 4,534,289, Cl. 101-348.000.
Heidrich, John E.: *See*—
Wolf, Charles B.; Meyer, Thomas N.; Fey, Maurice G.; and Heidrich, John E., 4,535,225, Cl. 219-383.000.
Heijenga, Berend: *See*—
de Leur, Eric J. A.; and Heijenga, Berend, 4,534,353, Cl. 128-346.000.
Heimann, Robert L. Brake cable fitting including scraper means. 4,534,239, Cl. 74-501.00R.
Heise Manufacturing: *See*—
Blackston, Michael D.; and Reinecke, Gary, 4,534,131, Cl. 49-42.000.
Hemm, Stephen R.: *See*—
Evans, Brian E.; Hemm, Stephen R.; and Russell, Rupert A. V., 4,535,285, Cl. 324-71.100.
Hemmelgarn, Donald J.; and Grow, Arthur L., to International Paper Company. Apparatus for manufacturing ovenable paperboard articles. 4,534,725, Cl. 425-394.000.
Hemotec, Inc.: *See*—
Smith, Leland B.; and Jackson, Jacqueline J., 4,534,939, Cl. 422-61.000.
Henderson, Donald W. Cutting implement and method of making same. 4,534,827, Cl. 156-647.000.
Henderson, Ronald C., to Mathewson Corporation. Outboard motor system. 4,534,737, Cl. 440-53.000.
Hendricks, Charles J.: *See*—
Chen, Lee; Hendricks, Charles J.; Mathad, Gangadhara S.; and Poloncic, Stanley J., 4,534,816, Cl. 156-345.000.
Henkel Corporation: *See*—
Gladfelter, Elizabeth J.; Rogier, Edgar R.; and DiDomenico, Edward D., 4,535,148, Cl. 528-365.000.
Peerman, Dwight E.; and Rogier, Edgar R., 4,534,907, Cl. 260-410.600.
Henry, Raymond L.: *See*—
Adams, Dennis V.; Cremers, Norbert J.; and Henry, Raymond L., 4,534,958, Cl. 424-45.000.
Hense, Karl R.: *See*—
Harr, Jerome D.; and Hense, Karl R., 4,535,371, Cl. 360-67.000.
Hercules Incorporated: *See*—
Newburg, Norman R., deceased, 4,535,097, Cl. 521-139.000.
Herman, Harry H., Jr., to International Healthcare Products, Inc. Bathtub cushion lift stabilization. 4,534,074, Cl. 4-564.000.
Herman, Thomas; and Williams, Oliver, to International Rectifier Corporation. A.C. Solid state relay circuit and structure. 4,535,251, Cl. 250-551.000.
Hermann, Dietmar: *See*—
Fischer, Rolf; and Hermann, Dietmar, 4,534,724, Cl. 425-295.000.
Hermansen, Ralph D.: *See*—
Bilow, Norman; and Hermansen, Ralph D., 4,534,882, Cl. 252-182.000.
Hermansson, Leif A. G.: *See*—
Carlstrom, Elis; Johnsson, Agneta I.; and Hermansson, Leif A. G., 4,534,936, Cl. 419-36.000.
Herschler, Max G., to Owens-Corning Fiberglas Corporation. Method and apparatus for heating a mineral fiber forming spinner. 4,534,779, Cl. 65-6.000.
Herson, Mark I.: *See*—
Frey, Sydney W., Jr.; and Herson, Mark I., 4,535,386, Cl. 361-389.000.
Herstein, Morris S.; Smith, Walter P.; and Hawkins, Geoffrey R., to Richardson-Vicks Inc. Hair conditioning shampoo. 4,534,964, Cl. 424-70.000.
Hesh, Frank; and Groh, Edward F. Lightweight chuck for woodturning lathe. 4,534,574, Cl. 279-112.000.
Hess, Peter; Schulz, Volkmar; and Rampel, Hans, to Metallwerk Max Brose GmbH & Co. Fastening arrangement for a motor vehicle seat including a seat adjusting device. 4,534,534, Cl. 248-424.000.
Hetz, G. Brian. Method of making polymeric belt cutting apparatus. 4,534,102, Cl. 29-558.000.
Hetz, G. Brian. Polymeric belt cutting apparatus. 4,534,687, Cl. 409-157.000.
Hewlett-Packard Company: *See*—
Tullis, Barclay J., 4,534,389, Cl. 141-98.000.
Wright, Conrad L.; Bearrs, James G.; Chan, C. S.; Hay, Robert R.; and Ura, Frank, 4,535,343, Cl. 346-140.00R.
Heyer, Hal B. Vascular puncture dressing. 4,534,762, Cl. 604-180.000.
Heyne, Carl J.; and Deis, Daniel W., to Westinghouse Electric Corp. Electromagnetic launcher with high repetition rate switch. 4,534,263, Cl. 89-8.000.
Hiemstra, Carol L.: *See*—
Bart, Gordon B.; Hiemstra, Carol L.; and Tyo, James H., 4,534,341, Cl. 128-75.000.
Higashiguchi, Teruaki; and Miyakawa, Nobuhiro, to Mita Industrial Co., Ltd. Photosensitive material for electrophotography containing photosensitive layer incorporating pentakisazo pigment. 4,535,044, Cl. 430-58.000.
Highnam, Alan W.: *See*—
Stephen, David; Mansbridge, Martin H.; and Highnam, Alan W., 4,534,503, Cl. 228-157.000.
Higuchi, Takeshi; Itakura, Yoshio; and Iwamori, Hidekazu, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Swash-plate-type compressor having suction and discharge damping chambers. 4,534,710, Cl. 417-269.000.
Hildel, Heinz; Schnell, Wolfgang; and Westphal, Gerald, to Triumph-Adler Aktiengesellschaft fur Buro- and Informationstechnik. Photoelectric keyboard. 4,534,668, Cl. 400-477.000.
Hill, John W.; and Sword, Anthony J., to Microbot, Inc. Control and force-sensing method and apparatus for motors. 4,535,405, Cl. 364-400.000.
Hillstrom, Kennert E. G.; and Fransson, Rolf G., to Victor Hasselblad Aktiebolag. Slide guide adjusting device at slide projector. 4,534,631, Cl. 353-95.000.
Hilt, Milton B.: *See*—
Davis, L. Berkley, Jr.; Hilt, Milton B.; and Wilkes, Colin, 4,534,165, Cl. 60-39.020.

Hilti Aktiengesellschaft: *See*—
Jochum, Peter, 4,534,500, Cl. 227-7.000.

Hiltner, Jeffrey A.: *See*—
Briley, Bruce E.; and Hiltner, Jeffrey A., 4,535,360, Cl. 358-181.000.

Hilton-Davis Chemical Co., The: *See*—
Schmidt, Paul J.; and Hung, William M., 4,535,172, Cl. 549-310.000.

Himmelbauer, Alain J.; and Poubelle, Regis J. P., to U.S. Philips Corporation. Cordless telephone system with security coding. 4,535,200, Cl. 179-2.0EA.

Hintermeier, Karl: *See*—
Dorries, Peter; Gotze, Thomas; Piesch, Steffen; Schon, Manfred; Wulff, Gunther; Hintermeier, Karl; Wulff, Gunther; and Hintermeier, Karl, 4,535,031, Cl. 428-481.000.
Dorries, Peter; Gotze, Thomas; Piesch, Steffen; Schon, Manfred; Wulff, Gunther; Hintermeier, Karl; Wulff, Gunther; and Hintermeier, Karl, 4,535,031, Cl. 428-481.000.

Hiramatsu, Takeo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Automatic transmission gear system for vehicles. 4,534,244, Cl. 74-869.000.

Hiranuma, Satoshi, to Trio Kabushiki Kaisha. Pickup arm driving control system with repeat playback function. 4,535,437, Cl. 369-223.000.

Hirata, Osamu: *See*—
Kano, Kuniomi; Fushimoto, Hideo; Sekine, Kazumi; Miyagawa, Akira; Hirata, Osamu; and Nishimuro, Yoshiaki, 4,535,416, Cl. 364-715.000.

Hirate, Masatoshi: *See*—
Tsukamoto, Kou; and Hirate, Masatoshi, 4,535,261, Cl. 310-78.000.

Hirbour, Louis: *See*—
Johnson, Frank; Reese, Dieter; and Hirbour, Louis, 4,534,843, Cl. 204-202.000.

Hird, Edwin A. Measurement conversion and visual display instrument. 4,535,415, Cl. 364-562.000.

Hirobe, Hitoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Spot exposure adjustment circuit. 4,535,364, Cl. 358-228.000.

Hirohata, Michio; and Ikari, Hideo, to Canon Kabushiki Kaisha. Exposure control device for camera. 4,534,638, Cl. 354-418.000.

Hirose, Takao: *See*—
Uemura, Seiichi; Hirose, Takao; and Sohda, Yoshio, 4,534,950, Cl. 423-447.400.

Hirota, Eiichi: *See*—
Nomura, Noboru; Hirota, Eiichi; and Wasa, Kiyotaka, 4,535,376, Cl. 360-126.000.

Hirota, Yoshinobu: *See*—
Takaishi, Kazuhide; Kadonaga, Toshiki; Tamura, Masamitsu; Nakamura, Shigeharu; Mizoguchi, Mitsuru; Hirota, Yoshinobu; and Yamazaki, Yukinobu, 4,534,199, Cl. 72-276.000.

Hisano, Akira: *See*—
Itoh, Yasuo; Kato, Hideo; Matsumura, Kugako; Nishikawa, Tomoyasu; Hisano, Akira; Yamada, Takehisa; and Koshinaka, Eiichi, 4,534,980, Cl. 514-570.000.

Hisey, Durward A., to Ey-C Company, Inc. Chimney cap. 4,534,280, Cl. 98-67.000.

Hitachi Construction Machinery Co., Ltd.: *See*—
Yagyu, Takashi; Yamaguchi, Takeshi; Tanaka, Sotaro; and Sakaki, Yasuo, 4,534,268, Cl. 91-6.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Kokuryo, Yoshiro, 4,535,295, Cl. 328-155.000.
Tanaka, Shuhei, 4,535,231, Cl. 250-201.000.

Hitachi, Ltd.: *See*—
Fujimura, Takashi; Takahashi, Katsuyu; and Nishizawa, Masahiro, 4,535,234, Cl. 250-238.000.
Kokuryo, Yoshiro, 4,535,295, Cl. 328-155.000.
Ogasawara, Tsuyoshi; Ichiryu, Ken; Nakamura, Ichiro; and Kido, Yasuo, 4,534,452, Cl. 187-29.00A.
Osuga, Minoru; and Oyama, Yoshishige, 4,534,330, Cl. 123-440.000.
Ueno, Sadayasu, 4,534,218, Cl. 73-204.000.
Yamaoka, Yukinori; and Takahashi, Takeshi, 4,535,383, Cl. 361-341.000.

Hitachi, Ltd: *See*—
Yoshikawa, Kazuaki; Matsumura, Yuichi; and Mase, Noriaki, 4,534,932, Cl. 376-310.000.

Hitachi Service Engineering Co., Ltd.: *See*—
Yoshikawa, Kazuaki; Matsumura, Yuichi; and Mase, Noriaki, 4,534,932, Cl. 376-310.000.

Hiura, Hiromi: *See*—
Yoshikane, Tetsuo; Kagata, Akira; and Hiura, Hiromi, 4,534,136, Cl. 51-283.00R.

Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, to Dow Chemical Company, The. Aqueous dispersions of vinylidene chloride resins. 4,535,120, Cl. 524-560.000.

Hobel, Hans-Gunther: *See*—
Elischer, Stefan; Hobel, Hans-Gunther; Merkt, Robert; and Wagner, Fritz, 4,535,160, Cl. 544-191.000.

Hoccum Developments Limited: *See*—
Calvert, Colin; and Cox-Smith, Peter, 4,534,755, Cl. 494-37.000.

Hockensmith, John L.: *See*—
Grove, John L.; Hockensmith, John L.; and Coffman, Allen B., 4,534,575, Cl. 280-6.110.

Hoechst Aktiengesellschaft: *See*—
Blumbach, Jurgen; and Schindler, Peter, 4,535,156, Cl. 544-26.000.
Damman, Ben; Scheffer, Hans; de Witte, Paul; Krause, Johannes; Haas, Hans; and Kowalski, Werner, 4,534,946, Cl. 423-315.000.
Fuchs, Hermann; and Filzinger, Klaus, 4,534,908, Cl. 260-458.00C.

Hoesch Werke AG: *See*—
Kliesch, Wilfried; Koch, Friedrich-Otto; Wahl, Hans-Jurgen; Krebs, Rolf; Schorr, Peter; and Strauch, Heinz, deceased, 4,535,215, Cl. 219-61.500.

Hofer, Adalbert: *See*—
Kuckein, Wilfried; Mylius, Albert; Bechtel, Peter; and Hofer, Adalbert, 4,535,017, Cl. 428-77.000.

Hoffman, Paul R.: *See*—
Cuff, Richard A.; and Hoffman, Paul R., 4,534,562, Cl. 273-149.00P.

Hoffmann, Hans-Josef: *See*—
Ozelli, Riza N.; Hoffmann, Hans-Josef; and Lippert, Hartmut, 4,535,121, Cl. 524-715.000.

Hoffmann-La Roche Inc.: *See*—
Klaus, Michael; Loeliger, Peter; and Weiser, Harald, 4,535,086, Cl. 514-337.000.

Hoffpauir, Charles R.: *See*—
de Lorenzo, Mark X.; Hoffpauir, Charles R.; Hutchins, Johnnie R.; Meyer, Timmy R.; Page, John E.; and Poehl, Michael E., 4,535,134, Cl. 526-88.000.

Hofmann, Peter, to Dr. Ing. h.c.F. Porsche AG. Air discharge installation for the air feed into the interior space of a vehicle. 4,534,275, Cl. 98-2.000.

Hoganson, Robert B., Jr.: *See*—
Riggs, Peter P.; Data, Harry L.; and Hoganson, Robert B., Jr., 4,534,162, Cl. 57-217.000.

Hogge, Charles R., Jr., to Rockwell International Corporation. Signal detection apparatus. 4,535,459, Cl. 375-80.000.

Hokkaido University: *See*—
Sanada, Yuzo; Yokoyama, Susumu; Chiba, Tadatoshi; Yokono, Tetsuro; Moritomi, Hiroshi; Obara, Toshiyuki; and Nagaishi, Hiroshi, 4,534,848, Cl. 208-10.000.

Hokuriku Pharmaceutical Co., Ltd.: *See*—
Itoh, Yasuo; Kato, Hideo; Matsumura, Kugako; Nishikawa, Tomoyasu; Hisano, Akira; Yamada, Takehisa; and Koshinaka, Eiichi, 4,534,980, Cl. 514-570.000.

Holder, Homer W.: *See*—
Toub, Samuel G.; Gilliland, James L., Jr.; and Holder, Homer W., 4,534,182, Cl. 62-193.000.

Holland, Geoffrey N., to Picker International Limited. Signal generator for interfacing digital computer to a plurality of peripheral devices. 4,535,403, Cl. 364-200.000.

Hollister Incorporated: *See*—
Habib, Wagdi W., 4,534,767, Cl. 604-336.000.
Osburn, Frank G.; and Riedel, Kenneth E., 4,534,768, Cl. 604-350.000.

Holman, J. Harrison; and Holman, Jay C. Method of convection cooking of food. 4,534,987, Cl. 426-523.000.

Holman, Jay C.: *See*—
Holman, J. Harrison; and Holman, Jay C., 4,534,987, Cl. 426-523.000.

Holmes, Kenneth P., to Wide-Lite International. High frequency circuit for operating a high-intensity, gaseous discharge lamp. 4,535,271, Cl. 315-209.00R.

Holstein, Siegbert, to Johannes Heidenhain GmbH. Length measuring apparatus. 4,534,113, Cl. 33-125.00R.

Holsworth, Herbert. Electrically heated steering wheel with adhesively attached foil strip heating element. 4,535,221, Cl. 219-204.000.

Holub, Fred F.: *See*—
Abolins, Visvaldis; and Holub, Fred F., 4,535,106, Cl. 524-151.000.

Holzner, Gunter, to Firmenich SA. Multiple compartment plastic packing. 4,534,509, Cl. 239-34.000.

Homeyer, Bernhard: *See*—
Maurer, Fritz; Homeyer, Bernhard; and Becker, Benedikt, 4,535,091, Cl. 514-407.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ban, Keisuke; and Daimaru, Akimasa, 4,534,400, Cl. 164-97.000.
Matsuda, Minoru; and Mitsuishi, Toshiro, 4,534,322, Cl. 123-55.00R.
Matsuda, Tamotsu, 4,534,507, Cl. 237-12.30A.
Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Yoshizawa, Hiroshi, 4,534,236, Cl. 74-364.000.
Sekizaki, Satoshi; Hosoya, Eiji; and Takasu, Hotoyuki, 4,534,440, Cl. 180-215.000.
Shimazaki, Taiichi; and Takenaka, Masahico, 4,534,439, Cl. 180-215.000.
Shimizu, Motohiro; and Fujii, Shigeru, 4,535,281, Cl. 322-28.000.
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,535,334, Cl. 340-995.000.
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Sugimura, Masao, 4,535,335, Cl. 340-995.000.
Tsukamoto, Hiroaki, 4,534,173, Cl. 60-606.000.

Honda, Nobuyasu; Yamakawa, Toshiro; and Ikeda, Toshimitsu, to Mita Industrial Co., Ltd. Pressure-fixing toner for electrophotography and process for preparation thereof. 4,535,049, Cl. 430-137.000.

Honda, Norio: *See*—
Wakabayashi, Tetsushi; Honda, Norio; and Sakuma, Osamu, 4,535,384, Cl. 361-386.000.

Honda, Seiichirou; Ogawara, Hiroshi; and Fukuda, Mutsumi, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Composition for partitioning blood components. 4,534,798, Cl. 106-266.000.

Honeywell Inc.: *See*—
Castleman, Bruce W.; McQuire, David P.; and Szonntagh, Eugene L., 4,534,777, Cl. 55-181.000.
Vogels, Joseph A., 4,534,728, Cl. 431-80.000.

Honeywell Information Systems, Inc.: *See*—
Carey, Richard A.; and Falk, Jerry, 4,535,330, Cl. 340-825.500.
Shenk, William H., 4,535,404, Cl. 364-200.000.
Honig, Gunter: *See*—
van Belzen, David; Honig, Gunter; Lotterbach, Gerhard; van Woudenberg, Jan-Faas; and Zucker, Udo, 4,534,331, Cl. 123-492.000.
Honnigford, Edward H.: *See*—
Dham, Vinod K.; Honnigford, Edward H.; Stewart, John K., Jr.; Pfeifer, Robert F.; and Trudel, Murray L., 4,534,104, Cl. 29-571.000.
Hooper, David W., to Unique Oil Tools, Inc. Packer weighted and pressure differential method and apparatus for Big Hole drilling. 4,534,426, Cl. 175-65.000.
Hoover, Alan A.; and Harris, Richard D., to Pentek Corporation. Motion detector and control system for an accumulating live conveyor. 4,534,462, Cl. 198-781.000.
Hopkins, Quentin G.; and Browning, Jhonce N., to FMC Corporation. Stabilization of high purity hydrogen peroxide. 4,534,945, Cl. 423-273.000.
Horie, Seiji: *See*—
Kawamura, Kouichi; Horie, Seiji; and Sato, Hideo, 4,535,045, Cl. 430-60.000.
Horikawa, Kazuo: *See*—
Ohara, Yuji; and Horikawa, Kazuo, 4,535,342, Cl. 346-108.000.
Horike, Masanori; Furukawa, Tatsuya; Ebi, Yutaka; and Yamazaki, Hiroshi, to Ricoh Company, Ltd. Deflection control type ink jet recorder. 4,535,339, Cl. 346-75.000.
Horler, Hansulrich; and Perego, Ambrogio, to BBC Brown, Boveri & Company, Limited. Externally mounted exhaust-gas turbocharger with uncooled gas duct. 4,534,700, Cl. 415-135.000.
Horn, Stuart B.; Wright, Richard A.; and Dunmire, Howard L., to United States of America, Army. Linear resonance cryogenic cooler. 4,534,176, Cl. 62-6.000.
Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Multifunctional lubricant additives and compositions thereof. 4,534,872, Cl. 252-32.70E.
Horrobin, David F., to Efamol Limited. Pharmaceutical and dietary composition. 4,535,093, Cl. 514-560.000.
Horsley, John K.: *See*—
Harrington, Timothy C.; and Horsley, John K., 4,534,252, Cl. 83-310.000.
Horton Manufacturing Co., Inc.: *See*—
Brooks, Edward D., 4,534,454, Cl. 192-18.00A.
Hosiden Electronics Co., Ltd.: *See*—
Takihara, Yukio, 4,534,610, Cl. 339-206.00P.
Hosoda, Jun: *See*—
Handa, Ryoji; Hosoda, Jun; and Yoshida, Norimasa, 4,535,131, Cl. 525-369.000.
Hosoya, Eiji: *See*—
Sekizaki, Satoshi; Hosoya, Eiji; and Takasu, Hotoyuki, 4,534,440, Cl. 180-215.000.
Houlon, Louis P.: *See*—
Froment, Jean-Paul; and Houlon, Louis P., 4,534,385, Cl. 139-79.000.
Howard, Billy D.: *See*—
Cabus, Marcello M.; Howard, Billy D.; Colt, James W.; and Tuft, Edward S., 4,534,118, Cl. 34-34.000.
Howard, Durrell U. Remotely adjustable steering compensator. 4,534,577, Cl. 280-90.000.
Howard, Robin G., to Denny Bros. Printing. Adhesive labels. 4,534,582, Cl. 283-81.000.
Howden, Ashley G.: *See*—
Jones, Lawrence T.; Lee, Robert S.; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., 4,534,745, Cl. 446-398.000.
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Brault, Robert G.; and Miller, Leroy J., 4,535,054, Cl. 430-325.000.
DuPont, Preston S.; Ritter, Robert E.; and Stafford, John P., 4,534,998, Cl. 427-122.000.
Reeds, John W., 4,535,249, Cl. 250-491.100.
Sashital, Sanat K., 4,534,822, Cl. 156-624.000.
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Hunter, Joe M., to Celanese Corporation. Process for preparing epoxy resins having low hydrolyzable chlorine contents. 4,535,150, Cl. 528-489.000.
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Cade, Paul E., 4,534,804, Cl. 148-1.500.
Chen, Lee; Hendricks, Charles J.; Mathad, Gangadhara S.; and Poloncic, Stanley J., 4,534,816, Cl. 156-345.000.
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Furman, Anatol, 4,535,428, Cl. 365-230.000.
Goth, George R.; Hansen, Thomas A.; and Villetto, Robert T., Jr., 4,534,826, Cl. 156-643.000.
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King, David E.; Markovich, Voya; Sambucetti, Carlos J.; Tisdale, Stephen L.; and Trevitt, Donna J., 4,534,797, Cl. 106-1.230.
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Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., 4,534,890, Cl. 252-522.00R.

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Rabinovich, Lev M.; Jurovsky, Albert Y.; Brodkin, Jury M.; Puginsky, Viktor A.; Iordan, Georgy G.; Serdjukov, Vilen I.; Sukhodolets, Vadim K.; Tikhnova, Galina V.; and Golikova, Galina M., 4,535,283, Cl. 323-365.000.

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Ishida, Keiichi; Okumura, Junji; and Agetsuma, Fumio, to Aisin Seiki Kabushiki Kaisha. Thermopneumatic mechanism for opening and closing a radiator grille. 4,534,506, Cl. 236-35.300.

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Isobe, Yasuo: *See—*
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Italtel Societa Italiana Telecomunicazioni S.p.A.: *See—*
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Itani, Abdallah M., to General Electric Company. Means and method for simultaneously triggering series SCR's. 4,535,400, Cl. 363-68.000.

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Ivac Corporation: *See—*
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Iwakura, Ken; and Ishige, Sadao, to Fuji Photo Film Co., Ltd. Fluoran derivatives and recording material using same. 4,535,348, Cl. 346-221.000.
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Iwasaki, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Scanning type laser system. 4,534,615, Cl. 350-6.100.
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Damrau, Wayne A.; Vreeland, William C.; Bernert, Richard; and Wohrle, Albert, 4,534,309, Cl. 118-410.000.
Jabarin, Saleh A., to Owens-Illinois, Inc. Oriented, high density poly(ethylene terephthalate). 4,535,025, Cl. 428-220.000.
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Jahn, Hans-Georg: *See—*
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Jahnke, William R.; Rockel, Bruce H.; Brown, Barry J.; Hawley, Floyd E.; Pennella, Andrew J.; Sugrue, John C.; and Wiggins, William R., to Textron Inc. Beo-type machining system. 4,534,093, Cl. 29-26.00A.
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Janisch, Gerhard: *See—*
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Jaworowsky, Igor. Method and apparatus for water flow stimulation in a well. 4,534,413, Cl. 166-302.000.
Jenkins, Garry W. Smokers equipment. 4,534,369, Cl. 131-235.100.
Jenkins, James O. M.; and Gardner, Nigel C., to Siliconix Limited. Bridge rectifier circuit. 4,535,203, Cl. 179-81.00R.
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Jesseman, Rodney J., to Armco Inc. Low alloy steel plate and process for production thereof. 4,534,805, Cl. 148-12.300.
Jet Research Center, Inc.: *See—*
Regalbuto, John A., 4,534,423, Cl. 175-4.600.
JGC Corporation: *See—*
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Jiang, Ching-Lin, to Mostek Corporation. Control of serial memory. 4,535,427, Cl. 365-205.000.
Jim Walter Resources, Inc.: *See—*
White, Claude C.; and Carr, Frederick, 4,534,679, Cl. 405-261.000.
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Jindrick, James A.; Dolnik, Thomas G.; Nohria, Naresh K.; Gilker, Clyde; Hurley, James R.; Dunk, Michael P.; Reis, Norbert J.; and Bray, Thomas J., to McGraw-Edison Company. Microprocessor based recloser control. 4,535,409, Cl. 364-481.000.
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Grove, John L.; Hockensmith, John L.; and Coffman, Allen B., 4,534,575, Cl. 280-6.110.
Job, Robert C., to Shell Oil Company. Olefin polymerization catalyst compositions and polymerization process. 4,535,068, Cl. 502-107.000.
Jochum, Peter, to Hilti Aktiengesellschaft. Setting device with a driving piston propelled by high pressure gases. 4,534,500, Cl. 227-7.000.
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Berns, Harald, 4,534,501, Cl. 227-65.000.
Johannes Heidenhain GmbH: *See—*
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Duryee, Peter S.; and Anholm, John M., Jr., 4,535,318, Cl. 340-347.0CC.
John Zink Company: *See—*
Reed, Robert D.; and Cegielski, John M., Jr., 4,534,300, Cl. 110-171.000.
Johnson, Bernard H. Apparatus for milling a gear for a double enveloping worm gear drive. 4,534,684, Cl. 409-26.000.
Johnson, Edwin A., to Allied Corporation. Fuel distribution control for an internal combustion engine. 4,535,406, Cl. 364-431.080.
Johnson, Frank; Reese, Dieter; and Hirbour, Louis, to Technic, Inc. Apparatus for electroplating and chemically treating contact elements of encapsulated electronic components and their like. 4,534,843, Cl. 204-202.000.
Johnson, George E.; and Brenner, Stanley, to Leviton Manufacturing Company, Inc. Combined liner locking and locking washer system for mounting an incandescent lamp. 4,535,398, Cl. 362-404.000.
Johnson, Gerald E.: *See—*
Graham, James T.; and Johnson, Gerald E., 4,534,460, Cl. 198-482.000.
Johnson, John H., to SKF Industries, Inc. Lubricant insert for rolling bearings. 4,534,871, Cl. 252-12.000.
Johnson, Marvin M.: *See—*
McDaniel, Max P.; Johnson, Marvin M.; Hawley, Gil R.; Westerman, John; and Smith, Paul D., 4,535,070, Cl. 502-208.000.
Johnson, Raymond G., Jr.; Trustee, Bill L.; and Fischer, William C., to United Technologies Corporation. Pneumatic control valve actuator computer control arrangement. 4,534,702, Cl. 416-20.00R.
Johnson, Roy B.: *See—*
Scerbo, Joseph E.; and Johnson, Roy B., 4,534,269, Cl. 91-41.000.
Johnson, Terry L., to Beatrice Foods Co. Automatic lock for farm equipment transport wheel. 4,534,416, Cl. 172-311.000.
Johnson, Theodore C., Sr. Wheel position control for railway maintenance vehicle. 4,534,297, Cl. 105-215.00C.
Johnson, Timothy W.; and Banasiak, Dennis S., to Phillips Petroleum Company. Inhibition of water treeing in polymers of ethylene. 4,535,116, Cl. 524-385.000.
Johnsson, Agneta I.: *See—*
Carlstrom, Elis; Johnsson, Agneta I.; and Hermansson, Leif A. G., 4,534,936, Cl. 419-36.000.
Johnston, Gary M.; and Ciupak, Leonard A. Method and apparatus for conveying a flexible, imperforate member through a fluid. 4,534,635, Cl. 354-322.000.
Johnston, Paul D., to Genentech, Inc. Removal of impurities from human leukocyte interferon preparations. 4,534,906, Cl. 260-112.00R.
Jones, Howard: *See—*
Loev, Bernard; Chan, Wan-Kit; and Jones, Howard, 4,534,979, Cl. 514-529.000.
Jones, Jack E., to Xerox Corporation. Document belt normal force control. 4,534,551, Cl. 271-275.000.
Jones, Lawrence T.; Lee, Robert S.; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., to California R&D Center. Percussion cap firing toy vehicle and track assembly. 4,534,745, Cl. 446-398.000.
Jones, Roy C. Traveling valve assembly. 4,534,715, Cl. 417-456.000.
Jones, William J., Jr. Apparatus for transporting firewood. 4,534,576, Cl. 280-47.260.
Jonsson, Mats; and Eden, Per-Olof. Method and device for taking soil samples. 4,534,231, Cl. 73-864.430.
Jouve, Hubert; and Magnin, Joel, to Commissariat a l'Energie Atomique. Magnetic bubble memory with unimplanted motifs. 4,535,422, Cl. 365-36.000.
Joy Manufacturing Company: *See—*
Mullins, Lance A.; and Self, Michael A., 4,535,326, Cl. 340-679.000.
Jung, Stig. Roller shade return mechanism. 4,534,396, Cl. 160-298.000.
Jurovsky, Albert Y.: *See—*
Rabinovich, Lev M.; Jurovsky, Albert Y.; Brodkin, Jury M.; Puginsky, Viktor A.; Iordan, Georgy G.; Serdjukov, Vilen I.; Sukhodolets, Vadim K.; Tikhnova, Galina V.; and Golikova, Galina M., 4,535,283, Cl. 323-365.000.
K. J. Law Engineers, Inc.: *See—*
Targosz, Thomas C., 4,534,212, Cl. 73-83.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See—*
Konishi, Satoshi, 4,534,429, Cl. 177-25.000.
Kabushiki Kaisha Kobe Seiko Sho: *See—*
Takaishi, Kazuhide; Kadonaga, Toshiki; Tamura, Masamitsu; Nakamura, Shigeharu; Mizoguchi, Mitsuru; Hirota, Yoshinobu; and Yamazaki, Yukinobu, 4,534,199, Cl. 72-276.000.
Tuda, Goro, 4,534,694, Cl. 414-735.000.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Saito, Hiroshi, 4,534,676, Cl. 405-184.000.
Kabushiki Kaisha Sato: *See—*
Kashiwaba, Tadao, 4,534,518, Cl. 242-56.00R.

Kabushiki Kaisha Suwa Seikosha: *See—*
Araki, Ryosuke, 4,534,623, Cl. 350-339.00R.
Kurita, Hirohisa, 4,534,661, Cl. 368-250.000.
Mori, Masahiko; Arai, Kenichiro; and Tezuka, Chikao, 4,534,665, Cl. 400-145.200.

Kabushiki Kaisha Toshiba: *See—*
Kodama, Toshikazu; and Sato, Koji, 4,535,265, Cl. 310-313.00C.
Minikane, Tomiharu, 4,534,651, Cl. 356-440.000.
Watanabe, Junji, 4,534,666, Cl. 400-207.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Higuchi, Takeshi; Itakura, Yoshio; and Iwamori, Hidekazu, 4,534,710, Cl. 417-269.000.
Muramatsu, Shigeru; Asai, Isao; and Morita, Takayuki, 4,534,517, Cl. 242-35.50A.

Kabushiki Kaisha Universal: *See—*
Okada, Kazuo, 4,534,560, Cl. 273-143.00R.

Kabushikikaisha Aichidenkikosakusho: *See—*
Yamamoto, Osamu; and Norizuki, Senichiro, 4,534,108, Cl. 7-152.000.

Kadex, Incorporated: *See—*
Aydin, Kemal, 4,534,194, Cl. 70-278.000.

Kadin, Saul B., to Pfizer Inc. Antiallergic and antiulcer 1-oxo-1H-thiazolo[3,2-a]pyrimidine-2-carboxamides and intermediates therefor. 4,535,081, Cl. 514-258.000.

Kadonaga, Toshiki: *See—*
Takaishi, Kazuhide; Kadonaga, Toshiki; Tamura, Masamitsu; Nakamura, Shigeharu; Mizoguchi, Mitsuru; Hirota, Yoshinobu; and Yamazaki, Yukinobu, 4,534,199, Cl. 72-276.000.

Kagata, Akira: *See—*
Yoshikane, Tetsuo; Kagata, Akira; and Hiura, Hiromi, 4,534,136, Cl. 51-283.00R.

Kai, Toshio: *See—*
Nakazato, Takuzo; Okuto, Koichiro; and Kai, Toshio, 4,534,678, Cl. 405-204.000.

Kainmuller, Thomas: *See—*
Troxler, Eduard; Kainmuller, Thomas; and Maul, Rudolf, 4,535,145, Cl. 528-289.000.

Kaiser, Steven W.: *See—*
Papa, Anthony J.; and Kaiser, Steven W., 4,535,187, Cl. 568-353.000.

Kaiya, Nobuo: *See—*
Sasaki, Shosaku; and Kaiya, Nobuo, 4,535,123, Cl. 524-862.000.

Kaj, Goran L.: *See—*
Axen, Rolf E.; Kaj, Goran L.; and Rigner, Bror S., 4,535,010, Cl. 427-246.000.

Kakita, Shusaku; and Yoshida, Thihiro, to Kasei Optonix, Ltd. Phosphate fluorescent substance. 4,534,885, Cl. 252-301.40P.

Kalinowski, James E.: *See—*
Rutten, Peter T.; and Kalinowski, James E., 4,534,306, Cl. 114-311.000.

Kallmeyer, James B.: *See—*
Funk, David B.; and Kallmeyer, James B., 4,534,229, Cl. 73-863.000.

Kaltenbach & Voigt GmbH & Co.: *See—*
Strohmaier, Ernst, 4,534,732, Cl. 433-29.000.

Kamijo, Ken; and Uekusa, Yasuyuki, to Nissan Motor Co., Ltd. Seat belt retractor. 4,534,441, Cl. 180-268.000.

Kaminski, Joan M.: *See—*
Horodysky, Andrew G.; and Kaminski, Joan M., 4,534,872, Cl. 252-32.70E.

Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; and Furukawa, Osamu, to Tokyo Shibaura Denki Kabushiki Kaisha. Varistor includes oxides of bismuth, cobalt, manganese, antimony, nickel and trivalent aluminum. 4,535,314, Cl. 338-21.000.

Kanbe, Mitsuru, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Liquid metal mechanical pump equipped with emergency syphon. 4,534,712, Cl. 417-366.000.

Kanda, Shuhei, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic record still mode reproduction apparatus and method. 4,535,367, Cl. 360-10.200.

Kaneko, Akinari: *See—*
Shindo, Masanari; Sato, Shigeru; and Kaneko, Akinari, 4,534,840, Cl. 204-192.00R.

Kang, Kenneth S.; and Veeder, George T., to Merck & Co., Inc. Heteropolysaccharide S-88. 4,535,153, Cl. 536-123.000.

Kaniecki, Michael; Landers, Samuel P.; and Botzman, Thomas J., to Goodyear Tire & Rubber Company, The. Coating material for use on sulfur vulcanized rubber. 4,535,114, Cl. 524-364.000.

Kano, Kuniomi; Fushimoto, Hideo; Sekine, Kazumi; Miyagawa, Akira; Hirata, Osamu; and Nishimuro, Yoshiaki, to Canon Kabushiki Kaisha. Electronic compact function calculator. 4,535,416, Cl. 364-715.000.

Kansai Paint Company, Ltd.: *See—*
Iida, Shinji, 4,535,126, Cl. 525-106.000.

Kanzai Paper Manufacturing Company Ltd.: *See—*
Arai, Naoto; Murakami, Takeshi; Suzuki, Toshitake; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,535,190, Cl. 568-721.000.

Kao Corporation: *See—*
Suzuki, Toshio; Watanabe, Hiroshi; and Tsushima, Rikio, 4,534,892, Cl. 252-545.000.

Karavaev, Alexandr A.: *See—*
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; Karavaev, Alexandr A.; and Yakushev, Vladimir M., 4,534,348, Cl. 128-305.000.

Kariakin, Joseph A., to Novi Development Corporation. Method for molding concrete slabs and battery mold therefor. 4,534,924, Cl. 264-259.000.

Karr, Michael A., Jr.: *See—*
Mitcham, John P.; and Karr, Michael A., Jr., 4,534,235, Cl. 74-128.000.

Kasbia, Puran S.; and Li, Yuan-Lu, to Northern Telecom Limited. Ground start detection in telephone loop signalling circuit. 4,535,201, Cl. 179-18.0FA.

Kasei Optonix, Ltd.: *See—*
Kakita, Shusaku; and Yoshida, Thihiro, 4,534,885, Cl. 252-301.40P.

Kashiwaba, Tadao, to Kabushiki Kaisha Sato. Automatic label winder. 4,534,518, Cl. 242-56.00R.

Kashubara, Dan. Vehicle wheel location device. 4,534,115, Cl. 33-203.180.

Kasner, William H.: *See—*
Krause, Robert F.; Rauch, Gary C.; and Kasner, William H., 4,535,218, Cl. 219-121.0LH.

Kassis, Amin I.; and Akili-Mudarris, Choukrie. Culture flask closure. 4,534,483, Cl. 215-306.000.

Katamoto, Kazuyoshi: *See—*
Nara, Kiyoshi; Katamoto, Kazuyoshi; and Ohta, Kazuhiko, 4,535,155, Cl. 544-20.000.

Kato, Chizuo, to Aluteck Co., Ltd. Decorative tile and method for manufacturing the same. 4,535,022, Cl. 428-142.000.

Kato, Hideo: *See—*
Itoh, Yasuo; Kato, Hideo; Matsumura, Kugako; Nishikawa, Tomoyasu; Hisano, Akira; Yamada, Takehisa; and Koshinaka, Eiichi, 4,534,980, Cl. 514-570.000.

Kato, Manabu; and Aoyama, Shunichi, to Nissan Motor Co., Ltd. Valve operation changing system of internal combustion engine. 4,534,323, Cl. 123-90.160.

Kato, Tadaaki: *See—*
Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, 4,534,975, Cl. 514-730.000.

Katoh, Minoru: *See—*
Kurono, Hitoshi; Taninaka, Kuniaki; Sugimoto, Tatsuyoshi; and Katoh, Minoru, 4,535,075, Cl. 514-96.000.

Katsura, Tadashi: *See—*
Minai, Masayoshi; and Katsura, Tadashi, 4,535,182, Cl. 560-231.000.

Kawada, Yasuyuki: *See—*
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,534,411, Cl. 166-274.000.

Kawagoe, Takashi: *See—*
Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,534,692, Cl. 414-282.000.

Kawaguchi, Kizo: *See—*
Matsuda, Teruo; and Kawaguchi, Kizo, 4,534,133, Cl. 51-58.000.

Kawaguchi, Toshio: *See—*
Kusumoto, Koshi; Kawaguchi, Toshio; Nakahara, Takeshi; and Kunimoto, Shinichiro, 4,535,102, Cl. 523-116.000.

Kawakami, Kiyoshi: *See—*
Naka, Yasushi; and Kawakami, Kiyoshi, 4,535,008, Cl. 427-246.000.

Kawamoto, Takashi: *See—*
Yamamura, Yukio; Nakayama, Jingo; Ikeda, Atsunobu; and Kawamoto, Takashi, 4,534,590, Cl. 297-180.000.

Kawamura, Eiichi: *See—*
Ishitani, Kenichiro; Unseki, Takashi; Amiboshi, Saburo; and Kawamura, Eiichi, 4,534,569, Cl. 277-27.000.

Kawamura, Kouichi; Horie, Seiji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Electric light-sensitive material containing a novel vinylidene chloride copolymer. 4,535,045, Cl. 430-60.000.

KCL Corporation: *See—*
Ferrell, Robert A.; and Rebber, Richard G., 4,534,752, Cl. 493-213.000.

Keefer, Larry K.; and Lunn, George, to United States of America, America. Reductive destruction of nitrosamines, hydrazines, nitramines, azo- and azoxy-compounds. 4,535,154, Cl. 544-106.000.

KEIO Electronic Laboratory Corporation: *See—*
Nakagawa, Koichi; Sugimori, Yoshio; Kimata, Yoshihide; Araki, Yosai; and Arai, Tomoji, 4,535,356, Cl. 358-145.000.

Keller, Roland. Muscle driven, single track bicycle. 4,534,578, Cl. 280-281.00R.

Kellogg, Scott T.: *See—*
Chakrabarty, Ananda M.; and Kellogg, Scott T., 4,535,061, Cl. 435-253.000.

Kelly, Michael G., to American Hoechst Corporation. Multi-ring fluorinated carbamates with textiles soil repellent activity. 4,534,770, Cl. 8-115.600.

Kelly, Robert C., to General Packaging Equipment Company. Apparatus for forming, filling and sealing bags with fluid contents. 4,534,159, Cl. 53-552.000.

Kelly, Ward L., to 49er Products. Mantle support device. 4,534,729, Cl. 431-110.000.

Kelm, James S.; Vickers, Edward C.; Williams, Jesse J.; and Taylor, Jack R., to United States of America, National Aeronautics and Space Administration. Flow modifying device. 4,534,166, Cl. 60-39.230.

Kelm, Roger W.; Merry, Glenn W.; and McArthur, William J., to Duracell Inc. Multi-cell power supply. 4,535,036, Cl. 429-99.000.

Kelman, Charles D. Intraocular lens and method of positioning the same in an eye. 4,534,069, Cl. 623-6.000.

Kemper, Franz, to Bergwerksverband GmbH. Mining tool with automatic sprinkler control. 4,534,597, Cl. 299-81.000.

Kempter, Karl, to Siemens Aktiengesellschaft. Image converted for X-ray equipment and the like. 4,535,468, Cl. 378-31.000.
Kendall, Cynthia E.: *See*—
Dreesman, Gordon R.; and Kendall, Cynthia E., 4,535,057, Cl. 435-5.000.
Kendrew, Thomas J.: *See*—
Reichman, James M.; O'Hanlon, Thomas A.; and Kendrew, Thomas J., 4,534,425, Cl. 175-53.000.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Dippel, Theodor; and Loida, Andreas, 4,534,893, Cl. 252-629.000.
Kerr, Blanche S., executrix: *See*—
Kerr, Ronald R., deceased; Smith, David W.; and Trenary, John M., 4,534,340, Cl. 128-66.000.
Kerr, Ronald R., deceased (by Kerr, Blanche S., executrix); Smith, David W.; and Trenary, John M., to Teledyne Industries, Inc. Combination handle. 4,534,340, Cl. 128-66.000.
Kessler, H. Fred: *See*—
Query, Grady W.; Query, O. Grady; and Kessler, H. Fred, 4,534,128, Cl. 43-132.100.
Kessler, John R. Method of making an ink roller assembly with capillary ink supply. 4,534,094, Cl. 29-148.40D.
Kewpie Kabushiki Kaisha: *See*—
Fujimura, Gen; Sotoma, Koichi; Kunikyo, Hiroshi; Hata, Masahito; and Inoue, Hidesuke, 4,534,284, Cl. 99-498.000.
Key Pharmaceuticals, Inc.: *See*—
Meltzer, Peter C.; and Coe, Jotham W., 4,535,157, Cl. 546-44.000.
Keystone Industries, Inc.: *See*—
Scott, Mark P., 4,534,298, Cl. 105-282.00R.
Khatri, Dilip K., to Electrical Equipment Limited. Touch-operated power control device. 4,535,254, Cl. 307-38.000.
KHD Canada, Inc.: *See*—
Slezak, Paul J., 4,534,456, Cl. 192-58.00A.
Khoobiar, Sargis, to Halcon SD Group, Inc., The. Conversion of isobutane to methacrolein. 4,535,188, Cl. 568-479.000.
Khromov, Sergei V.: *See*—
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; Karavaev, Alexandr A.; and Yakushev, Vladimir M., 4,534,348, Cl. 128-305.000.
Kido, Yasuo: *See*—
Ogasawara, Tsuyoshi; Ichiryu, Ken; Nakamura, Ichiro; and Kido, Yasuo, 4,534,452, Cl. 187-29.00A.
Kim, Miwon S., to Carter-Wallace, Inc. Pharmaceutical compositions. 4,534,973, Cl. 514-162.000.
Kim, Miwon S., to Carter-Wallace, Inc. Pharmaceutical compositions with codeine. 4,534,974, Cl. 514-161.000.
Kimata, Yoshihide: *See*—
Nakagawa, Koichi; Sugimori, Yoshio; Kimata, Yoshihide; Araki, Yosai; and Arai, Tomoji, 4,535,356, Cl. 358-145.000.
Kimura, Kiyoshi; Morita, Iwao; and Morimura, Seiichiro, to Nippon Shinyaku Co Limited. Antihypertensive phosphono derivatives of hantzsch dihydropyridines. 4,535,073, Cl. 514-89.000.
Kimura, Masashi: *See*—
Miura, Kunihiko; Takano, Shouji; and Kimura, Masashi, 4,534,642, Cl. 355-14.00E.
King, A. Douglas, Jr.: *See*—
Schade, John E.; and King, A. Douglas, Jr., 4,535,248, Cl. 250-459.100.
King, David E.; Markovich, Voya; Sambucetti, Carlos J.; Tisdale, Stephen L.; and Trevitt, Donna J., to International Business Machines Corporation. Method for providing an electroless copper plating bath in the take mode. 4,534,797, Cl. 106-1.230.
King, L. Tony; and Peters, Mark W., to Komax Systems, Inc. Proportioning device. 4,534,655, Cl. 366-137.000.
Kirkhuff, Shield & Fink: *See*—
Kirkhuff, William J., 4,535,002, Cl. 427-203.000.
Kirkhuff, William J., to Kirkhuff, Shield & Fink. Process for rendering a material fire retardant. 4,535,002, Cl. 427-203.000.
Kishi, Hajimu; Tanaka, Kunio; and Seki, Masaki, to Fanuc Ltd. Numerical control machining method and apparatus. 4,535,408, Cl. 364-475.000.
Kishi, Toru; and Saito, Takashi, to Victor Company of Japan, Ltd. Apparatus for playing back rotating recording mediums. 4,535,433, Cl. 369-77.200.
Kishi, Yoshio, to Sony Corporation. Optical disc and disc drive mechanism. 4,535,434, Cl. 369-111.000.
Kiso, Mataichiro; Futakawa, Akemi; and Fukunaga, Tokio, to Mitsubishi Denki Kabushiki Kaisha. Strike diagnosis apparatus. 4,534,206, Cl. 73-12.000.
Kistner, Oscar J., to Mead Corporation, The. Method of forming intermediate folded blanks for center special slotted containers. 4,534,753, Cl. 493-453.000.
Kitani, Masakatu: *See*—
Arai, Naoto; Murakami, Takeshi; Suzuki, Toshitake; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,535,190, Cl. 568-721.000.
Kitayama, Hiroyuki; and Kobayashi, Toyoko. Electrophotographic photosensitive member with electron donor and acceptor layers. 4,535,042, Cl. 430-56.000.
Kitayama, Masayasu; Sugimori, Yoshiaki; and Ohta, Schunich, to Nihon Sanso Kabushiki Kaisha. Absorbent for treating gases containing the materials used for semiconductor products and process of treating such gases with the same. 4,535,072, Cl. 502-411.000.
Kitik, Walter: *See*—
D'Onofrio, Anthony; and Kitik, Walter, 4,534,743, Cl. 445-24.000.
Kiyoto, Shinichiro; and Fujiwara, Chikara, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for manufacturing a mold. 4,534,196, Cl. 72-61.000.
Klaus, Michael; Loeliger, Peter; and Weiser, Harald, to Hoffmann-La Roche Inc. 4,5,6,7-Tetrahydro-4,4,7,7-tetramethylbenzo[8]thien-2-yl or furan-2-yl derivatives. 4,535,086, Cl. 514-337.000.
Kleeper, John R.; Reid, John M.; Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi. Apparatus for measuring the characteristics of an ultrasonic wave medium. 4,534,220, Cl. 73-599.000.
Klein, Jurgen; and Schulz, Peter, to Bergwerksverband GmbH. Method for regeneration of moist powder adsorption agents. 4,535,065, Cl. 502-21.000.
Klessing, Klaus, to Willmar Schwabe GmbH & Co. Optionally N-substituted aminodesoxy-1.4;3.6-dianhydrohexitol derivatives. 4,535,158, Cl. 544-118.000.
Kliesch, Wilfried; Koch, Friedrich-Otto; Wahl, Hans-Jurgen; Krebs, Rolf; Schorr, Peter; and Strauch, Heinz, deceased (by Strauch, Ruth, Christel Strauch, legal representatives), to Hoesch Werke AG. Method and device for controlling the welding process in the manufacturing of pipes with longitudinal seams. 4,535,215, Cl. 219-61.500.
Kline, Richard H., to General Motors Corporation. Battery grid and method of making same. 4,534,091, Cl. 29-2.000.
Kline, Richard H., to General Motors Corporation. Battery grid. 4,535,040, Cl. 429-234.000.
Kloots, Jacobus; and Marengo, John, to Luxtec Corporation. Fiberoptic cable assemblies. 4,534,617, Cl. 350-96.200.
Knapp, Charles A., to United States of America, Army. Red phosphorous smoke producing composition. 4,534,810, Cl. 149-19.600.
Kneen, Geoffrey, to Burroughs Wellcome Co. Pharmaceutical compounds, preparation, use and intermediates therefor and their preparation. 4,535,183, Cl. 514-568.000.
Kneip, George D., Jr.: *See*—
Lee, Reuy-Lin; Kneip, George D., Jr.; and Anderson, Marvin H., 4,535,291, Cl. 324-320.000.
Kobashi, Toshiyuki; and Takao, Seiji, to Japan Exlan Company Limited. High strength polyacrylonitrile fiber and method of producing the same. 4,535,027, Cl. 428-364.000.
Kobayashi, Kazuyoshi; and Takizawa, Shozo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Suspension system for vehicles. 4,534,580, Cl. 280-712.000.
Kobayashi, Toyoko: *See*—
Kitayama, Hiroyuki; and Kobayashi, Toyoko, 4,535,042, Cl. 430-56.000.
Koch, Friedrich-Otto: *See*—
Kliesch, Wilfried; Koch, Friedrich-Otto; Wahl, Hans-Jurgen; Krebs, Rolf; Schorr, Peter; and Strauch, Heinz, deceased, 4,535,215, Cl. 219-61.500.
Kochloefl, Karel: *See*—
Schneider, Michael; Kochloefl, Karel; and Ladebeck, Jurgen, 4,535,071, Cl. 502-342.000.
Kodama, Toshikazu; and Sato, Koji, to Kabushiki Kaisha Toshiba. Surface acoustic wave transducer with internal acoustic reflection. 4,535,265, Cl. 310-313.00C.
Koehl, Robert: *See*—
Logel, Bernard; and Koehl, Robert, 4,535,226, Cl. 219-400.000.
Koehler, Gernot: *See*—
Naarmann, Herbert; and Koehler, Gernot, 4,535,039, Cl. 429-213.000.
Koehring GmbH: *See*—
Vural, Gulertan, 4,534,419, Cl. 173-1.000.
Koene, Casper H.; Vos, Cornelis; and Brasser, Jan, to Naarden International N.V. Process for flavoring dry vegetable matter. 4,534,983, Cl. 426-293.000.
Koenig, Kurt L. Portable traffic warning light. 4,535,331, Cl. 340-908.000.
Kogan, Abraham; and Moore, Uri, to Gason Energy Engineering Ltd. Method and apparatus for the absorption of a gas in a liquid and their use in energy conversion cycles. 4,534,175, Cl. 60-649.000.
Koishi, Kenji: *See*—
Satoh, Isao; Yoshida, Tomio; Ohara, Shunji; and Koishi, Kenji, 4,535,439, Cl. 369-275.000.
Kojima, Tetsuhiko: *See*—
Sugimori, Shigeru; Kojima, Tetsuhiko; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,534,883, Cl. 252-299.630.
Kojo, Hidehiko; and Akimoto, Koji, to Asahi Denka Kogyo K.K. Coating composition. 4,535,103, Cl. 523-450.000.
Koki, Sasaki: *See*—
Toshimasa, Kuroda; Akio, Kimura; Takumi, Horiuchi; Koki, Sasaki; and Terukuni, Ikuta, 4,534,164, Cl. 57-290.000.
Kokuryo, Yoshiro, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Method and device for controlling the phase of timing signal. 4,535,295, Cl. 328-155.000.
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Komax Systems, Inc.: *See*—
King, L. Tony; and Peters, Mark W., 4,534,655, Cl. 366-137.000.
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Kondo, Takeo: *See*—
Ochii, Kiyofumi; Masuda, Masami; and Kondo, Takeo, 4,535,255, Cl. 307-264.000.
Koning, Gerrit; and Bergveld, Piet, to Cordis Europa, N.V. Method of making an electrochemical sensing cell. 4,534,825, Cl. 156-644.000.
Konishi, Satoshi, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing apparatus. 4,534,429, Cl. 177-25.000.
Konishi, Yuichiro; Tsunekawa, Tokuichi; and Someya, Hiromi, to Canon Kabushiki Kaisha. Camera having an exposure mode change-over device. 4,534,639, Cl. 354-432.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Ohnuki, Mitsuo, 4,534,625, Cl. 350-429.000.
Shindo, Masanari; Sato, Shigeru; and Kaneko, Akinari, 4,534,840, Cl. 204-192.00R.
Korevaar, Geerlof J., to U.S. Philips Corporation. Terminal arrangement for a duplex transmission system. 4,535,443, Cl. 370-24.000.
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Brauer, Wolfgang; Korte, Siegfried; Neukam, Theo; and Suling, Carlhans, 4,535,139, Cl. 526-287.000.
Korthoff, Herbert W., to United States Surgical Corporation. Surgical fastener member having increased rate of absorption. 4,534,352, Cl. 128-334.00C.
Kortovich, James W.; and Micinski, Eugene, to Union Carbide Corporation. Manufacture of high quality graphite electrodes using calcined anthracite coal as raw material. 4,534,951, Cl. 423-448.000.
Kosal, Jeffrey A.; and Plueddemann, Edwin P., to Dow Corning Corporation. Detergent composition with siliconate-zeolite and silicate builder. 4,534,880, Cl. 252-174.130.
Koshii, Taro: *See*—
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Itoh, Yasuo; Kato, Hideo; Matsumura, Kugako; Nishikawa, Tomoyasu; Hisano, Akira; Yamada, Takehisa; and Koshinaka, Eiichi, 4,534,980, Cl. 514-570.000.
Kosuzume, Hiroshi: *See*—
Ohnishi, Haruo; Kosuzume, Hiroshi; Suzuki, Yasuo; and Mochida, Ei, 4,534,966, Cl. 424-94.000.
Kovacina, Thomas A.; DeMarco, Ronald A.; and Snow, Arthur W., to United States of America, Navy. Mono (pentafluorosulfur diacetylene,polymer therefrom, and preparations thereof. 4,535,011, Cl. 427-255.600.
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Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , 4,534,782, Cl. 71-21.000.
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Koyanagi, Katubumi; Take, Hiroshi; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Constant current/constant voltage drive for an electrochromic display cell. 4,535,329, Cl. 340-785.000.
Koyanagi, Yuzo, to Sanwa Seiki Mfg. Co., Ltd. Digital control method. 4,535,402, Cl. 364-152.000.
Koziol, Konrad: *See*—
Zollner, Dieter H.; Zollner, Christine; Schieber, Franz; Lauterbach-Dammler, Inge; and Koziol, Konrad, 4,534,836, Cl. 204-67.000.
Kramer, Cornelis: *See*—
Zonneveld, Frans W.; and Kramer, Cornelis, 4,535,245, Cl. 250-385.000.
Kraus, Charles J.; Stoller, Herbert I.; and Wu, Leon L., to International Business Machines Corporation. High density wired module. 4,535,388, Cl. 361-414.000.
Kraus, Richard B., to General Kinematics Corporation. Method of and apparatus for forming a liner in a furnace or other vessel. 4,534,730, Cl. 432-3.000.
Kraus, Robert G.; and Quick, James R., to International Paper Company. Non-woven heating element. 4,534,886, Cl. 252-502.000.
Krause, Johannes: *See*—
Damman, Ben; Scheffer, Hans; de Witte, Paul; Krause, Johannes; Haas, Hans; and Kowalski, Werner, 4,534,946, Cl. 423-315.000.
Krause, Robert F.; Rauch, Gary C.; and Kasner, William H., to Westinghouse Electric Corp. Laser scribing apparatus and process for using. 4,535,218, Cl. 219-121.0LH.
Kreager, William D.; and Berger, Kenneth R., to Frito-Lay, Inc. Method and apparatus for ultrasonic sealing. 4,534,818, Cl. 156-466.000.
Krebs, Rolf: *See*—
Kliesch, Wilfried; Koch, Friedrich-Otto; Wahl, Hans-Jurgen; Krebs, Rolf; Schorr, Peter; and Strauch, Heinz, deceased, 4,535,215, Cl. 219-61.500.
Kremer, Richard D.: *See*—
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Kretschmer, Alfred, to BASF Aktiengesellschaft. Apparatus for applying treating media onto webs. 4,534,308, Cl. 118-260.000.
Kreusch, Edward G.; and Brodzik, Bruce F., to Culligan International Company. System for removing iron and/or other chemically reducing substances from potable water. 4,534,867, Cl. 210-722.000.
Krishnan, Sivaram: *See*—
Price, Ronald L.; Witman, Mark W.; and Krishnan, Sivaram, 4,535,143, Cl. 528-174.000.
Kroupa, Loretta A., to Dow Corning Corporation. Liquid curable polyorganosiloxane compositions. 4,535,141, Cl. 528-15.000.
Krstenansky, John L.; and Currie, Bruce L., to University of Illinois, The Board of Trustees of the. 5H-6-oxo-2,3,4,4a,7,7a-hexahydropyrano[2,3-b]pyrrole and the preparation thereof. 4,535,169, Cl. 548-453.000.
Krupp Bruninghaus GmbH: *See*—
Hegemann, Fritz; and Beihammer, Horst, 4,534,418, Cl. 172-708.000.
Krutchen, Charles M.; and Wu, Wen-Pao, to Mobil Oil Corporation. Polymer foam, thermoformed shapes thereof and methods of forming same. 4,535,100, Cl. 521-180.000.
Kryger, Allen C., to Squirt & Company. Aseptic juice or beverage and flavor enhancement system therefor. 4,534,991, Cl. 426-592.000.
Kryze, Jiri: *See*—
Clerget, Michel; Germain, Francois; Kryze, Jiri; and Poujois, Robert, 4,534,650, Cl. 356-376.000.
Ksaacson, Henry V.; and Wright, Hal E., to Eastman Kodak Company. Chloroaluminumphthalocyanine exhibiting reduced green spectral absorption. 4,535,046, Cl. 430-78.000.
Kubota, Hayato: *See*—
Yoshida, Hideaki; and Kubota, Hayato, 4,534,982, Cl. 426-36.000.
Kuckein, Wilfried; Mylius, Albert; Bechtel, Peter; and Hofer, Adalbert, to Messerschmitt-Bolkow-Blohm GmbH; and G & H Montage GmbH. Heat-resistant lining for wall, such as helicopter engine compartment bulkhead, and wall lined therewith. 4,535,017, Cl. 428-77.000.
Kudamatsu, Akio: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,535,076, Cl. 514-128.000.
Kuehne, Richard O., to W. R. Grace & Co., Cryovac Div. Puncture-resistant bag and method for vacuum packaging bone-in meat. 4,534,984, Cl. 426-412.000.
Kufrin, Fred W.: *See*—
Zahn, William L.; and Kufrin, Fred W., 4,534,471, Cl. 211-39.000.
Kuhl, David K.: *See*—
Rothfuss, Robert G.; Kuhl, David K.; Bilotti, Federico; Melling Hugh; and Mills, Earl J., 4,534,351, Cl. 128-334.00R.
Kuhn, Beryl M. Addition of resins to latex bonded nonwoven fabrics for improved strength. 4,535,013, Cl. 427-389.900.
Kulberg, Gerardus H., deceased: *See*—
Dirkse, Franciscus J.; and Kulberg, Gerardus H., deceased, 4,535,242, Cl. 250-363.00S.
Kulberg-Nierstrasz, Julia F., heiress: *See*—
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Kun, Zoltan K.; and Malmberg, Paul R., to Westinghouse Electric Corp. Thin film electroluminescent line array emitter and printer. 4,535,341, Cl. 346-107.00R.
Kunikyo, Hiroshi: *See*—
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Kunkel, Fred: *See*—
Schroder, Peter; Kunkel, Fred; and Hummel, Peter, 4,534,290, Cl. 101-365.000.
Kurakake, Mitsuo, to Fanuc Ltd. Position control apparatus and method. 4,535,277, Cl. 318-561.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Sawa, Yuji; Itoh, Toshio; and Adachi, Kuniomi, 4,534,155, Cl. 53-459.000.
Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, 4,534,975, Cl. 514-730.000.
Kurisu, Yoshitaka: *See*—
Hashimoto, Masahide; Kurisu, Yoshitaka; Zuiki, Shigeo; and Sasaki, Yoshio, 4,534,183, Cl. 62-374.000.
Kurita, Hirohisa, to Kabushiki Kaisha Suwa Seikosha. Electric alarm wristwatch including cylindrical sound tube for transmitting sound. 4,534,661, Cl. 368-250.000.
Kuroda, Kazuo, to Pioneer Electronic Corporation. Compression/expansion device. 4,535,471, Cl. 381-2.000.
Kuroda Seiko Company Limited: *See*—
Hozumi, Kazuhiro; and Tamaki, Shigeo, 4,534,381, Cl. 137-625.650.
Kurono, Hitoshi; Taninaka, Kuniaki; Sugimoto, Tatsuyoshi; and Katoh, Minoru, to Nihon Nohyaku Co., Ltd. Dithiolane derivative, process for producing the same and use thereof. 4,535,075, Cl. 514-96.000.
Kurt Wolf & Co. KG: *See*—
Wolf, Kurt; and Andre, Wolfram K., 4,535,229, Cl. 219-440.000.
Kurtz, Mark E. Water sterilization system. 4,535,247, Cl. 250-436.000.
Kurz, Gerhard. Pressure-sensitive electrical switch. 4,535,209, Cl. 200-83.00R.
Kurz, John L.: *See*—
Harshbarger, Harry F.; Kurz, John L.; and Young, Patrick J., 4,534,192, Cl. 70-118.000.

Kusters, Eduard: *See*—
Ahrweiler, Karl-Heinz; Anstotz, Helmut; and Hartmann, Werner, 4,534,829, Cl. 162-361.000.
Kusumoto, Koshi; Kawaguchi, Toshio; Nakahara, Takeshi; and Kunimoto, Shinichiro, to Tokuyama Soda Kabushiki Kaisha. Adhesive coating material. 4,535,102, Cl. 523-116.000.
Kuznetzoff, Philip, to Burroughs Corporation. Display panel and method of making it. 4,534,744, Cl. 445-47.000.
La Telemecanique Electrique: *See*—
Moreau, Dominique; Duchemin, Pierre; and Duchemin, Jean-Pierre, 4,535,309, Cl. 335-42.000.
Labbe, Francis A., to Mlins PLC. Cigarette manufacture. 4,534,368, Cl. 131-110.000.
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Parks, James D.; Moss, Charles A.; and Dyer, Kermit W., 4,534,281, Cl. 98-115.300.
Labeda, David P.; Goodman, Joseph J.; Borders, Donald B.; Testa, Raymond T.; and Martin, John H. E. J., deceased (by Martin, Mary B., executrix), to American Cyanamid Company. Antibacterial antibiotics LL-CO8078α_1, α_2, α_3 and β . 4,534,970, Cl. 424-122.000.
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Ladin, Eli M., to Federal-Mogul Corporation. Self-aligning clutch release bearing assembly. 4,534,458, Cl. 192-98.000.
Ladriere, Serje. Solar collectors. 4,534,336, Cl. 126-431.000.
Laesser, Claude, to ETA S.A., Fabriques d'Ebauches. Portable device including a visible mechanism. 4,534,660, Cl. 368-220.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Petit, Roland, 4,534,227, Cl. 73-861.870.
Rigouard, Alain, 4,534,864, Cl. 210-603.000.
Lamb Technicon Corp.: *See*—
Graham, James T.; and Johnson, Gerald E., 4,534,460, Cl. 198-482.000.
Lambelin, Georges E.: *See*—
Franz, Michel R.; Vincze, Andreas B.; Lambelin, Georges E.; and Polat, Alain V., 4,534,911, Cl. 514-575.000.
Lamoreux, Larry W. Sagittal knee test apparatus. 4,534,364, Cl. 128-774.000.
Lancaster, Janet M.: *See*—
Atkinson, Alan W.; Dearden, Katryna J.; and Lancaster, Janet M., 4,534,922, Cl. 264-119.000.
Landers, Samuel P.: *See*—
Kaniecki, Michael; Landers, Samuel P.; and Botzman, Thomas J., 4,535,114, Cl. 524-364.000.
Lane, Clyde H., to United States of America, Air Force. Electrical method of making conductive paths in silicon. 4,534,100, Cl. 29-586.000.
Lane, Lawrence J., to General Electric Company. Shaft voltage suppression circuit. 4,535,377, Cl. 361-1.000.
Lane, Michael S.; and Scholbrock, Steven D., to AT&T Information Systems. Conferencing system adaptive signal conditioner. 4,535,445, Cl. 370-62.000.
Lang, Winfried: *See*—
More, Anton; Lang, Winfried; Riedle, Rudolf; Straussberger, Herbert; and Streckel, Willi, 4,534,791, Cl. 75-10.00R.
Lani, Giuseppe: *See*—
Martelli, Daniele; and Lani, Giuseppe, 4,535,267, Cl. 313-481.000.
Lankton, Gordon B., to Nypro Inc. Manufacture and use of closely spaced attachments. 4,534,464, Cl. 206-343.000.
Lardner, Graham G., to Unipart Group, Limited. Heat exchangers. 4,534,407, Cl. 165-81.000.
Lares, Joseph P., to Lares Research. Swivel dental handpiece. 4,534,734, Cl. 433-126.000.
Lares Research: *See*—
Lares, Joseph P., 4,534,734, Cl. 433-126.000.
Larock, Richard C., to Iowa State University Research Foundation Inc. Synthesis of bicyclic and tricyclic 7-oxa prostaglandin endoperoxide analogs via oxypalladation of norbornadiene. 4,535,179, Cl. 560-117.000.
LaRosa, John; and Panipinto, David C., to American Can Company. Undercut punch to control ironing. 4,534,201, Cl. 72-348.000.
Larson, Eldon E., to Eltech Innovations Inc. Perforating, seal-greasing apparatus and method. 4,534,449, Cl. 184-105.200.
Larson, Kenneth H.: *See*—
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Laskowski, Gordon J.: *See*—
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Laton, Richard W.: *See*—
Ward, Charles S.; Laton, Richard W.; and Spada, John A., 4,535,302, Cl. 330-287.000.
Latsch, Reinhard; and Schlembach, Hans, to Robert Bosch GmbH. Externally ignited internal combustion engine. 4,534,327, Cl. 123-263.000.
Lau, Wah. Adjustable buckle. 4,534,087, Cl. 24-163.00K.
Laub, Herman, III. One-piece childproof tamper-evident bottle and cap. 4,534,477, Cl. 215-215.000.
Laufer, Helmut: *See*—
Eheim, Franz; and Laufer, Helmut, 4,534,332, Cl. 123-502.000.
Laursen, Donald, Jr., to Thrum, Edmund Arthur. Game playing apparatus. 4,534,559, Cl. 273-113.000.
Lauterbach-Dammler, Inge: *See*—
Zollner, Dieter H.; Zollner, Christine; Schieber, Franz; Lauterbach-Dammler, Inge; and Koziol, Konrad, 4,534,836, Cl. 204-67.000.
Laviolette, Andre . Camera-protecting apparatus including a fan for deflecting particles. 4,534,632, Cl. 354-81.000.
Leach, Jack: *See*—
Bruner, Jeffrey W.; Davis, Delbert A.; and Leach, Jack, 4,535,015, Cl. 428-44.000.
Leach, Jerald G., to Texas Instruments Incorporated. Low power clock generator circuit. 4,535,465, Cl. 377-46.000.
Leavoy, Wayne P.: *See*—
Ambrose, John; Charles, Douglas K.; Conard, Bruce R.; Diaz, Carlos; O'Neill, Charles E.; and Leavoy, Wayne P., 4,534,935, Cl. 419-23.000.
Lecat, Jean: *See*—
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Lecoffre, Yves; and Marcoz, Jean, to Societe anonyme dite: Alsthom-Atlantique. Method of degassing a liquid. 4,534,774, Cl. 55-44.000.
Lecolier, Serge L. M. B.; and Raynal, Serge F., to Societe Nationale des Poudres et Explosifs. Associations of bases, resulting from the combination of a lithium alkyl or aryl with an alkali metal amide or hydride, polymerization process in which they are used, and product obtained. 4,535,135, Cl. 526-174.000.
Lecomte, Francois. Sail ski device. 4,534,305, Cl. 441-73.000.
Lectard, Alain; and Magrone, Robert. Process for converting hydragillite into boehmite. 4,534,957, Cl. 423-625.000.
Lee, Kenneth R.: *See*—
Cedrone, Nicholas J.; and Lee, Kenneth R., 4,534,605, Cl. 339-75.00M.
Lee, Raymond; Okey, David W.; and Ferro, Gregory A., to IMI-Tech Corporation. Polyimide foam from mixture of silicon containing diamine and different aromatic diamine. 4,535,099, Cl. 521-154.000.
Lee, Raymond; Sorathia, Usman A. K.; and Ferro, Gregory A., to Imi-Tech Corporation. Polyimide of 2,2-bis(4-(4-aminophenoxy)-phenyl)-hexafluoropropane and process for the preparation of same. 4,535,101, Cl. 521-189.000.
Lee, Reuy-Lin; Kneip, George D., Jr.; and Anderson, Marvin H., to Varian Associates, Inc. Method for superconducting magnet shimming. 4,535,291, Cl. 324-320.000.
Lee, Robert S.: *See*—
Jones, Lawrence T.; Lee, Robert S.; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., 4,534,745, Cl. 446-398.000.
Le Fur, Gerard R.: *See*—
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Lehmann, Hans W.: *See*—
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Lehner, August: *See*—
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Leiber, Heinz, to Robert Bosch GmbH. Hydraulic dual-circuit tandem main brake cylinder. 4,534,171, Cl. 60-551.000.
Leininger, Joel C.: *See*—
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Leloux, Arnoldus W. J., to Wavin B.V. Device for cooling molds. 4,534,184, Cl. 62-376.000.
Lembach, Kenneth J., to Miles Laboratories, Inc. Protein compositions substantially free from infectious agents. 4,534,972, Cl. 424-86.000.
Lemelson, Jerome H. Position indicating system and method. 4,535,414, Cl. 364-561.000.
Lenin Mezogazdasagi Termeloszovetkezet: *See*—
Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , 4,534,782, Cl. 71-21.000.
Lenzar Optics Corporation: *See*—
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Leopard, Wilton: *See*—
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Leporq, Serge: *See*—
Courty, Philippe; Roussel, Michel; Varin, Philippe; Le Page, Jean-Francois; and Leporq, Serge, 4,535,067, Cl. 502-84.000.
Lessard, Denis: *See*—
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Levental, Mark. Remote activated alarm triggering device. 4,535,324, Cl. 340-574.000.
Leviton Manufacturing Company, Inc.: *See*—
Johnson, George E.; and Brenner, Stanley, 4,535,398, Cl. 362-404.000.
Lewis, Christopher G.; and Martin, Patrick. Long shelf life cementitious anchoring capsule. 4,534,795, Cl. 106-89.000.
Lewis, James A.: *See*—
Howerton, Anderson W.; and Lewis, James A., 4,534,437, Cl. 180-185.000.

Lewis, Robert J.: *See*—
Burbank, Charles H.; and Lewis, Robert J., 4,534,433, Cl. 180-19.100.

Lewis, Shelton E.: *See*—
Pocock, John F. E.; Cole, Charles A.; Villanueva, James G.; Matlack, John D.; and Lewis, Shelton E., 4,534,995, Cl. 427-38.000.

Leybold-Heraeus GmbH: *See*—
Hartig, Klaus; Dietrich, Anton; and Scherer, Michael, 4,534,841, Cl. 204-192.00P.

LGT, Laboratoire General des Telecommunications: *See*—
Corbel, Jean Yves, 4,535,361, Cl. 358-184.000.

LHW Telephone Auto Diallers Limited: *See*—
Hughes, John; and Mouncher, John, 4,535,204, Cl. 179-90.0BD.

Li, Yuan-Lu: *See*—
Kasbia, Puran S.; and Li, Yuan-Lu, 4,535,201, Cl. 179-18.0FA.

Libsch, Thomas A.: *See*—
Wertheimer, Harry P.; Libsch, Thomas A.; Pfeifer, Jerome L.; and Becker, Paul C., 4,535,316, Cl. 338-34.000.

Lichti, Reiner, to Siemens Aktiengesellschaft. Drive circuit for piezoelectric transducer in ink jet printers. 4,535,346, Cl. 346-140.00R.

Liff, Lawrence J. Wax base makeup composition. 4,534,961, Cl. 424-63.000.

Lin, Samuel Q. S.; and Jacobine, Anthony F., to Loctite Corporation. Siloxane polyphotoinitiators of the substituted acetophenone type. 4,534,838, Cl. 204-159.130.

Linde Aktiengesellschaft: *See*—
Forster, Franz, 4,534,271, Cl. 91-472.000.

Lindema Kommanditbolag: *See*—
Andren, Ingmar, 4,534,859, Cl. 209-301.000.

Lindenmuth, Kevin: *See*—
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Lindner, Christian: *See*—
Binsack, Rudolf; Rempel, Dieter; Lindner, Christian; and Morbitzer, Leo, 4,535,124, Cl. 525-67.000.

Lindner, Otto: *See*—
Behre, Horst; Blank, Heinz U.; Burmeister, Gerhard; and Lindner, Otto, 4,534,905, Cl. 260-505.00C.

Lindqvist, Ake, to ASEA Aktiebolag. Safety device in an operating unit for an industrial robot. 4,535,207, Cl. 200-17.00R.

Lion Corporation: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,534,411, Cl. 166-274.000.

Lipid Specialties, Inc.: *See*—
Sears, Barry D., 4,534,899, Cl. 260-403.000.

Lippert, Hartmut: *See*—
Ozelli, Riza N.; Hoffmann, Hans-Josef; and Lippert, Hartmut, 4,535,121, Cl. 524-715.000.

Lipski, Mordechai. W.C. Seat for children. 4,534,072, Cl. 4-237.000.

Little, Edwin D.; and Minzghor, Karsten R., to Virginia Chemicals Inc. Sodium hydrosulfite slurries. 4,534,954, Cl. 423-515.000.

Ljubomir, Srnic. Apparatus for welding in vertical, horizontal and slanting position. 4,535,213, Cl. 219-57.000.

Locher, Johannes: *See*—
Fischer, Werner; Flaig, Ulrich; and Locher, Johannes, 4,534,328, Cl. 123-359.000.

Locke, Frank W., to Champion International Corporation. Unitary cellular partition for containers. 4,534,504, Cl. 229-15.000.

Loctite Corporation: *See*—
Lin, Samuel Q. S.; and Jacobine, Anthony F., 4,534,838, Cl. 204-159.130.

Loegstrup, Joergen; and Sparre, Preben C., to A/S Loegstrup-Steel. Current connecting device for the establishing of electrical connection between conductors. 4,534,612, Cl. 339-255.00P.

Loeliger, Peter: *See*—
Klaus, Michael; Loeliger, Peter; and Weiser, Harald, 4,535,086, Cl. 514-337.000.

Loev, Bernard; Chan, Wan-Kit; and Jones, Howard, to USV Pharmaceutical Corp. Polyene compounds useful in the treatment of psoriasis and allergic responses. 4,534,979, Cl. 514-529.000.

Loflin, Carl B.: *See*—
Stubbs, John L.; and Loflin, Carl B., 4,534,296, Cl. 104-8.000.

Logel, Bernard; and Koehl, Robert, to De Dietrich & Cie. Domestic electric cooking oven. 4,535,226, Cl. 219-400.000.

Loh, William, to Chevron Research Company. Herbicidal 5-deoxy-3-O-arylmethyl or substituted arylmethyl-1,2-O-ethylene-alpha-D-xylofuranose derivatives. 4,534,785, Cl. 71-88.000.

Loida, Andreas: *See*—
Dippel, Theodor; and Loida, Andreas, 4,534,893, Cl. 252-629.000.

Lomax, Ronald W., to International Standard Electric Corporation. Electrical contact units. 4,535,312, Cl. 335-196.000.

Lombardino, Joseph G.; and Harbert, Charles A., to Pfizer Inc. Certain 4-(2-hydroxyethylthiomethyl)pyridines and derivatives thereof having immunoregulatory activity. 4,535,084, Cl. 514-277.000.

Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., to Union Carbide Corporation. Method for cracking residual oils. 4,534,853, Cl. 208-120.000.

Lopp, Loran C., Jr.: *See*—
Bonko, Mark L.; and Lopp, Loran C., Jr., 4,534,392, Cl. 152-209.00B.

Lorenz, Rainer, to Palitex Project-Company GmbH. Method and apparatus for splicing yarns. 4,534,160, Cl. 57-22.000.

Lotterbach, Gerhard: *See*—
van Belzen, David; Honig, Gunter; Lotterbach, Gerhard; van Woudenberg, Jan-Faas; and Zucker, Udo, 4,534,331, Cl. 123-492.000.

Louvel, Robin, to Bowthorpe-Hellermann Limited. Marking apparatus. 4,534,313, Cl. 118-696.000.

Lubzens, Daniel: *See*—
Cho, Alfred Y.; Glance, Bernard; Lubzens, Daniel; and Schneider, Martin V., 4,534,103, Cl. 29-571.000.

Lucas Industries: *See*—
Bowcott, Roy P., 4,534,326, Cl. 123-179.00B.

Lucas Industries Public Limited Company: *See*—
Allport, Maurice J., 4,535,264, Cl. 310-232.000.
Price, Anthony G.; and Gornall, Graham J., 4,534,172, Cl. 60-578.000.

Lucien, Staub, to National Company Air France, The. Leg-rest, notably for transport vehicles and especially for aeroplanes. 4,534,594, Cl. 297-438.000.

Lue, Ping-Chang: *See*—
Ratkowski, Donald J.; and Lue, Ping-Chang, 4,535,138, Cl. 526-279.000.

Lunn, George: *See*—
Keefer, Larry K.; and Lunn, George, 4,535,154, Cl. 544-106.000.

Luo, Tatao; Russo, Louis; and Freenor, Francis J., III, to Chevron Research Company. 1-Alkyl derivatives of 3-aryloxy-4-(2-carbalkoxy)-phenyl-azet-2-ones as plant growth regulators. 4,534,786, Cl. 71-88.000.

Lupke, Manfred A. A. Method and apparatus for forming a double walled thermoplastic tube with integral bells. 4,534,923, Cl. 264-156.000.

Lutsey, Thomas H.; and Bero, Vernon L., to Gold Bond Ice Cream, Inc. Forming and conveying of baked confection shells. 4,534,722, Cl. 425-104.000.

Luttge, Klaus: *See*—
Eltze, Georg; Luttge, Klaus; Pickard, Jurgen; Rubmann, Hans; and Sandner, Helmut, 4,534,457, Cl. 192-70.200.

Luxtec Corporation: *See*—
Kloots, Jacobus; and Marengo, John, 4,534,617, Cl. 350-96.200.

Luzzi, John J.: *See*—
Steinberg, David H.; Seltzer, Raymond; Luzzi, John J.; and Cortolano, Frank P., 4,534,874, Cl. 252-51.50A.

Lymneos, Anthony: *See*—
Dourdeville, Theodore A.; and Lymneos, Anthony, 4,534,659, Cl. 366-338.000.

Lyons, Bernard J.: *See*—
van Konynenburg, Peter H.; Lyons, Bernard J.; Smith-Johannsen, Robert; and Moyer, Wendell W., 4,534,889, Cl. 252-511.000.

M. A. Industries, Inc.: *See*—
Peacock, Bobbie D.; Mushovic, John N.; and Geyer, Roger D., 4,534,225, Cl. 73-860.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Schroder, Peter; Kunkel, Fred; and Hummel, Peter, 4,534,290, Cl. 101-365.000.

Maack, Werner, to AMP Incorporated. Wire insertion and terminal crimping tool. 4,534,107, Cl. 29-751.000.

MacAnlis, David H. Cross polarized wire grid antenna. 4,535,337, Cl. 343-737.000.

MacArthur, Alexander D.; and Everett, Harry J., to Westinghouse Electric Corp. Method for determining the amount of dissolved oxygen from above and below water level air leakage in a steam power plant. 4,534,320, Cl. 122-406.00R.

Macin, Bruce J.; and Bresin, Mark S., to Motorola, Inc. Method and apparatus for testing a sealed container. 4,534,208, Cl. 73-49.300.

Macklanburg-Duncan Company: *See*—
Haefner, LeRoy H.; and Rhodes, Stephen M., 4,534,117, Cl. 33-379.000.

MacLaughlin, Donald: *See*—
Fortuna, Vincent; and MacLaughlin, Donald, 4,534,751, Cl. 493-108.000.

MacPhail, David M., to Macpod Enterprises Ltd. Fit and support system for sports footwear. 4,534,122, Cl. 36-88.000.

Macpod Enterprises Ltd.: *See*—
MacPhail, David M., 4,534,122, Cl. 36-88.000.

Maddern, Thomas S.; Ansell, John W.; and Philip, Alexander S., to Plessey Company plc, The. Digital switching network for telecommunications exchange. 4,535,442, Cl. 370-13.000.

Maeda, Katsutoshi; and Shimoda, Ikuo, to JGC Corporation; and Oiles Industry Co., Ltd. Damping support for piping system. 4,534,535, Cl. 248-636.000.

Maeda, Yuji: *See*—
Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, 4,534,975, Cl. 514-730.000.

Maerz Ofenbau AG: *See*—
Fussl, Erwin; and Ranner, Max, 4,534,731, Cl. 432-14.000.

Magdefessel, Heinz, to Siemens Aktiengesellschaft. Getter sorption pump with heat accumulator for high-vacuum and gas discharge systems. 4,534,708, Cl. 417-51.000.

Magdo, Ingrid E., to International Business Machines Corporation. Method for manufacturing vertical PNP transistor with shallow emitter. 4,534,806, Cl. 148-1.500.

Magendans, Frederik; te Raa, Gerhardus A.; and van Rheenen, Bernhard J. P., to U.S. Philips Corporation. Method of manufacturing a rotary anode for X-ray tubes and anode thus produced. 4,534,993, Cl. 427-34.000.

Magg, Hans: *See*—
Schubart, Rudiger; and Magg, Hans, 4,534,901, Cl. 556-7.000.

Magliozzi, Bernard: *See*—
Metzger, Frederick B.; and Magliozzi, Bernard, 4,534,526, Cl. 244-38.000.

Magnetic Analysis Corporation: *See*—
Vitulli, Joseph L., Jr., 4,535,288, Cl. 324-161.000.
Magnetic Peripherals, Inc.: *See*—
Mowry, Gregory S; and George, Peter K., 4,535,375, Cl. 360-113.000.
Magnin, Joel: *See*—
Jouve, Hubert; and Magnin, Joel, 4,535,422, Cl. 365-36.000.
Magrone, Robert: *See*—
Lectard, Alain; and Magrone, Robert, 4,534,957, Cl. 423-625.000.
Magyar Tudomanyos Akademia Kozponti Hivatala: *See*—
Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , 4,534,782, Cl. 71-21.000.
Mahle GmbH: *See*—
Ripberger, Emil; and Stuska, Gotthard, 4,534,274, Cl. 92-187.000.
Makigawa, Shinji: *See*—
Sakaguchi, Susumu; Itoh, Ken; Ogihara, Masahiro; Makigawa, Shinji; Ryuo, Toshihiko; and Watanabe, Kazuyoshi, 4,534,821, Cl. 156-617.0SP.
Makisumi, Yasuo; Murabayashi, Akira; Tawara, Katsuya; Watanabe, Yoshihachi; and Takahashi, Toshio, to Shionogi & Co., Ltd. Propynylaminothiazole derivatives. 4,535,088, Cl. 514-370.000.
Malaval, Claude, to Novatome. Annular slab for closing the vessel of a fast neutron nuclear reactor. 4,534,140, Cl. 52-21.000.
Mali, David: *See*—
Glass, Henry P., 4,534,110, Cl. 30-346.570.
Malmberg, Paul R.: *See*—
Kun, Zoltan K.; and Malmberg, Paul R., 4,535,341, Cl. 346-107.00R.
Mammel, Lewis H.; and Shakespeare, Walter J., to AT&T Bell Laboratories. Air cleaner. 4,534,776, Cl. 55-136.000.
Manceau, Jean-Pierre: *See*—
Canet, Roland; Delhaes, Pierre; Dupart, Eliane; Pacault, Adolphe; Pascal, Claude; and Manceau, Jean-Pierre, 4,535,317, Cl. 338-36.000.
Manno, Joseph T. Wood burning stove heat exchanger. 4,534,319, Cl. 122-15.000.
Mannschke, Lothar, to U.S. Philips Corporation. Optical multiplexer. 4,535,440, Cl. 370-1.000.
Mansbridge, Martin H.: *See*—
Stephen, David; Mansbridge, Martin H.; and Highnam, Alan W., 4,534,503, Cl. 228-157.000.
Marcoz, Jean: *See*—
Lecoffre, Yves; and Marcoz, Jean, 4,534,774, Cl. 55-44.000.
Marengo, John: *See*—
Kloots, Jacobus; and Marengo, John, 4,534,617, Cl. 350-96.200.
Marinoza, Rene A. Process and apparatus for treating food products. 4,534,282, Cl. 99-451.000.
Mark, Harold W.; Bertus, Brent J.; Roberts, John S.; McKay, Dwight L.; and Fenska, Lyle E., to Philips Petroleum Company. Passivating metals on cracking catalysts. 4,535,066, Cl. 502-62.000.
Mark, Victor; and Hedges, Charles V., to General Electric Company. Dihydric phenols. 4,535,191, Cl. 568-727.000.
Markey, John W. Engine lifting tool. 4,534,588, Cl. 294-81.500.
Markovich, Voya: *See*—
King, David E.; Markovich, Voya; Sambucetti, Carlos J.; Tisdale, Stephen L.; and Trevitt, Donna J., 4,534,797, Cl. 106-1.230.
Marks, Bruce G.: *See*—
Frantz, Keith R.; Barnes, Robert A.; and Marks, Bruce G., 4,535,270, Cl. 315-8.000.
Markuntovich, Felix D.: *See*—
Bragin, Boris F.; Kolomiets, Alexandr S.; Korotkikh, Jury B.; Markuntovich, Felix D.; Olofinsky, Evgeny P.; Gladky, Petr V.; Perepletchikov, Evgeny F.; and Ekber, Boris Y., 4,534,540, Cl. 251-203.000.
Marquez, Alfredo D.: *See*—
Olson, David L.; and Marquez, Alfredo D., 4,534,793, Cl. 75-123.00N.
Mars Incorporated: *See*—
Plesko, George A., 4,534,459, Cl. 194-1.00D.
Marschner, Frank W., to Colgate-Palmolive Company. Sodium bicarbonate suspension as deodorant product. 4,534,962, Cl. 424-65.000.
Marsh, Hugh R., to Thorn Emi Instruments Limited. Low charge detector. 4,535,325, Cl. 340-636.000.
Martelli, Daniele; and Lani, Giuseppe, to SAES Getters S.p.A. Getter assembly with improved support. 4,535,267, Cl. 313-481.000.
Martin, David L., to Dow Corning Corporation. Molding process using room temperature curing silicone coatings to provide multiple release of articles. 4,534,928, Cl. 264-334.000.
Martin, F. Wayne; Shahbazi, Samson; and Schoonejongen, Ronald J., to Electro Materials Corp. of America. Fast curing solderable conductor. 4,535,012, Cl. 427-386.000.
Martin, Jimmy R.: *See*—
Milberger, Lionel J.; Martin, Jimmy R.; and Mataway, Thomas P., 4,534,583, Cl. 285-24.000.
Martin, John H. E. J., deceased: *See*—
Labeda, David P.; Goodman, Joseph J.; Borders, Donald B.; Testa, Raymond T.; and Martin, John H. E. J., deceased, 4,534,970, Cl. 424-122.000.
Martin, Kelly D., to Simmons Universal Corporation. Hospital bed having safety mechanism. 4,534,077, Cl. 5-424.000.
Martin Marietta Corporation: *See*—
Bergquist, Lyle E., 4,534,204, Cl. 73-1.00G.
Martin, Mary B., executrix: *See*—
Labeda, David P.; Goodman, Joseph J.; Borders, Donald B.; Testa, Raymond T.; and Martin, John H. E. J., deceased, 4,534,970, Cl. 424-122.000.
Martin, Patrick: *See*—
Lewis, Christopher G.; and Martin, Patrick, 4,534,795, Cl. 106-89.000.
Martinez, Charles H.: *See*—
Allan, David E.; and Martinez, Charles H., 4,534,851, Cl. 208-48.00R.
Martinot, Bernard: *See*—
Grasset, Daniel; and Martinot, Bernard, 4,534,942, Cl. 422-117.000.
Marvin Glass & Associates: *See*—
Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., 4,534,566, Cl. 273-248.000.
Ferris, Michael J.; Wise, Paul H.; and Breslow, Jeffrey D., 4,534,567, Cl. 273-255.000.
Mase, Noriaki: *See*—
Yoshikawa, Kazuaki; Matsumura, Yuichi; and Mase, Noriaki, 4,534,932, Cl. 376-310.000.
Mason, James R. Method of making a police restraint device. 4,534,097, Cl. 29-432.200.
Massachusetts Institute of Technology: *See*—
Glicksman, Leon R., 4,534,119, Cl. 34-95.000.
Weinberg, Robert A.; Tabin, Clifford J.; and Bradley, Scott M., 4,535,058, Cl. 435-6.000.
Massarelli, Liberto; and Capriotti, Luigi, to Societa Italiana Vetro-SIV-S.p.A. Turntable platter for record players. 4,535,438, Cl. 369-264.000.
Massol, Jean-Jacques, to Isover Saint-Gobain. Glass fibers for the reinforcement of cement. 4,534,796, Cl. 106-99.000.
Masuda, Masami: *See*—
Ochii, Kiyofumi; Masuda, Masami; and Kondo, Takeo, 4,535,255, Cl. 307-264.000.
Masuda, Mitsuya: *See*—
Ueda, Minoru; Iyehara, Sadahiro; Masuda, Mitsuya; Inohara, Shizuo; and Yamamoto, Keisuke, 4,535,272, Cl. 315-366.000.
Masuoka, Fujio: *See*—
Ariizumi, Shoji; Segawa, Makoto; and Masuoka, Fujio, 4,535,426, Cl. 365-182.000.
Mataway, Thomas P.: *See*—
Milberger, Lionel J.; Martin, Jimmy R.; and Mataway, Thomas P., 4,534,583, Cl. 285-24.000.
Mathad, Gangadhara S.: *See*—
Chen, Lee; Hendricks, Charles J.; Mathad, Gangadhara S.; and Poloncic, Stanley J., 4,534,816, Cl. 156-345.000.
Mathewson Corporation: *See*—
Henderson, Ronald C., 4,534,737, Cl. 440-53.000.
Mathis, Ronald D.; and Reed, Jerry O., to Phillips Petroleum Company. Stabilization of polyphenylene sulfide. 4,535,117, Cl. 524-397.000.
Matlack, John D.: *See*—
Pocock, John F. E.; Cole, Charles A.; Villanueva, James G.; Matlack, John D.; and Lewis, Shelton E., 4,534,995, Cl. 427-38.000.
Matner, Martin: *See*—
Perrey, Hermann; and Matner, Martin, 4,535,111, Cl. 524-199.000.
Matsubara, Nobuyuki: *See*—
Yoshinaga, Minoru; Matsubara, Nobuyuki; and Yamamoto, Ryuichi, 4,534,920, Cl. 264-29.200.
Matsuda, Minoru; and Mitsuishi, Toshiro, to Honda Giken Kogyo Kabushiki Kaisha. Arrangement for insertion of spark plugs in cylinder head. 4,534,322, Cl. 123-55.00R.
Matsuda, Tamotsu, to Honda Giken Kogyo Kabushiki Kaisha. Air temperature regulating apparatus for vehicles. 4,534,507, Cl. 237-12.30A.
Matsuda, Teruo; and Kawaguchi, Kizo, to Osaka Seiki Kabushiki Kaisha. Machine for superfinishing annular workpieces. 4,534,133, Cl. 51-58.000.
Matsuguchi, Michiharu: *See*—
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,535,120, Cl. 524-560.000.
Matsuhiro, Keiji; and Matsui, Minoru, to NGK Insulators, Ltd. Silicon nitride sintered bodies and a method for producing the same. 4,535,063, Cl. 501-97.000.
Matsui, Minoru: *See*—
Matsuhiro, Keiji; and Matsui, Minoru, 4,535,063, Cl. 501-97.000.
Matsumoto, Kazuo; Takabe, Seiichi; and Takashima, Kohki, to Tanabe Seiyaku Co., Ltd. Alkyloxazolylacetic acid derivative for the treatment of hyperlipidemia. 4,535,089, Cl. 514-374.000.
Matsumura, Kugako: *See*—
Itoh, Yasuo; Kato, Hideo; Matsumura, Kugako; Nishikawa, Tomoyasu; Hisano, Akira; Yamada, Takehisa; and Koshinaka, Eiichi, 4,534,980, Cl. 514-570.000.
Matsumura, Susumu: *See*—
Suzuki, Takashi; Matsumura, Susumu; and Ohtaka, Keiji, 4,534,637, Cl. 354-403.000.
Matsumura, Yuichi: *See*—
Yoshikawa, Kazuaki; Matsumura, Yuichi; and Mase, Noriaki, 4,534,932, Cl. 376-310.000.
Matsuo, Kenji; and Yamaguchi, Akira, to Tokyo Shibaura Denki Kabushiki Kaisha. Transmission gate relaxation oscillator having comparator. 4,535,305, Cl. 331-111.000.
Matsuoka, Shigeki; and Naitoh, Yoshihiro, to Daido Steel Company Limited. Process for removing adhered substance from steel ingots. 4,534,801, Cl. 134-15.000.

Matsushita Electric Industrial Company, Limited: *See*—
Imajima, Mituhiro, 4,534,727, Cl. 431-76.000.
Nomura, Noboru; Hirota, Eiichi; and Wasa, Kiyotaka, 4,535,376, Cl. 360-126.000.
Satoh, Isao; Yoshida, Tomio; Ohara, Shunji; and Koishi, Kenji, 4,535,439, Cl. 369-275.000.
Ueda, Minoru; Iyehara, Sadahiro; Masuda, Mitsuya; Inohara, Shizuo; and Yamamoto, Keisuke, 4,535,272, Cl. 315-366.000.
Wada, Hidekazu; Yoshino, Hironori; and Shiota, Kohei, 4,535,382, Cl. 361-319.000.
Yokobori, Nobuyoshi, 4,535,276, Cl. 318-254.000.
Yoshikane, Tetsuo; Kagata, Akira; and Hiura, Hiromi, 4,534,136, Cl. 51-283.00R.

Matsushita Electric Works, Ltd.: *See*—
Yamamura, Yukio; Nakayama, Jingo; Ikeda, Atsunobu; and Kawamoto, Takashi, 4,534,590, Cl. 297-180.000.

Matsuura, Norio: *See*—
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,535,120, Cl. 524-560.000.

Matsuzaki, Kazuhiko; and Hamada, Minoru, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyacetal copolymers and process for production thereof. 4,535,127, Cl. 525-154.000.

Matthews, John P.: *See*—
Rothermel, William F.; Matthews, John P.; Walker, James W.; and Coulter, Wallace H., 4,534,465, Cl. 206-443.000.

Maul, Rudolf: *See*—
Troxler, Eduard; Kainmuller, Thomas; and Maul, Rudolf, 4,535,145, Cl. 528-289.000.

Maurer, Fritz; Homeyer, Bernhard; and Becker, Benedikt, to Bayer Aktiengesellschaft. O-Pyrazolyl-N-cyanoalkylsulphenyl-carbamate pesticides. 4,535,091, Cl. 514-407.000.

Maxwell, Peter C.: *See*—
Hsieh, Jih-Han; Barer, Sol J.; and Maxwell, Peter C., 4,535,059, Cl. 435-142.000.

May, David C., to Minnesota Mining and Manufacturing Company. Elastomeric pavement marker. 4,534,673, Cl. 404-14.000.

May, Richard L., to Mr. Gasket Company. Portable spotlight. 4,535,397, Cl. 362-369.000.

Mayo, Irving A., to Artistic Desk Pad & Novelty Co., Inc. Tray stacking. 4,534,475, Cl. 211-126.000.

Mazda Motor Corporation: *See*—
Tanaka, Fusatoshi, 4,534,325, Cl. 123-90.270.

McAliley, J. Eugene; Daumit, Gene P.; and Ethridge, Fredrick A., to Celanese Corporation. Production of a carbon fiber multifilamentary tow which is particularly suited for resin impregnation. 4,534,919, Cl. 264-29.200.

McArdle, Francis H., to Boeing Company, The. Helicopter rotor control system with integrated hub. 4,534,704, Cl. 416-158.000.

McArthur, William J.: *See*—
Kelm, Roger W.; Merry, Glenn W.; and McArthur, William J., 4,535,036, Cl. 429-99.000.

McBee, David G.: *See*—
Sundberg, Donald C.; Bishop, Paul L.; and McBee, David G., 4,534,865, Cl. 210-692.000.

McBride, Mark A. Insulated panel system for storage tanks. 4,534,490, Cl. 220-435.000.

McCabe, Bernard J.; and Courtney, David T., to Ford Motor Company. Flushable metering pump. 4,534,717, Cl. 418-181.000.

McCain, G. Howard; Benezra, Leo L.; and Finch, Craig E., to Eltech Systems Corporation. Cation exchange electrolytic cell membranes and method for making and repairing. 4,535,112, Cl. 524-233.000.

McClosky, Robert B., to Wrapade Machine Company, Inc. Packaging machine. 4,534,158, Cl. 53-562.000.

McClung, Ronald G.: *See*—
Novak, William J.; and McClung, Ronald G., 4,534,943, Cl. 422-188.000.

McCullough, J. Douglas, Jr., to Shell Oil Company. High flow propylene polymer compositions. 4,535,125, Cl. 525-88.000.

McDaniel, Max P.; Johnson, Marvin M.; Hawley, Gil R.; Westerman, John; and Smith, Paul D., to Phillips Petroleum Company. Acrylamide polymer used to reduce fines in aluminum phosphate gel. 4,535,070, Cl. 502-208.000.

McDaniel, Paul L.: *See*—
Fishter, Robert E.; McDaniel, Paul L.; and Tefft, Stephen W., 4,534,823, Cl. 156-626.000.

McDonnell Douglas Corporation: *See*—
Finch, George W.; and Udd, Eric, 4,534,222, Cl. 73-653.000.
Williamson, Robert D.; and Furst, Sidney M., 4,534,813, Cl. 156-212.000.

McGill, Robert W.; and Robinson, Chris E., to Figgie International Inc. Case lift outfeed apparatus. 4,534,157, Cl. 53-531.000.

McGowen, Wayne H. Therapeutic device for a human body. 4,534,555, Cl. 272-145.000.

McGraw-Edison Company: *See*—
Jindrick, James A.; Dolnik, Thomas G.; Nohria, Naresh K.; Gilker, Clyde; Hurley, James R.; Dunk, Michael P.; Reis, Norbert J.; and Bray, Thomas J., 4,535,409, Cl. 364-481.000.

McIntyre, James A.; and Phillips, Robert F., to Dow Chemical Company, The. Separator-gas electrode combination. 4,534,845, Cl. 204-283.000.

McIver, Robert T., Jr., to Finnigan Corporation. Apparatus and method for injection of ions into an ion cyclotron resonance cell. 4,535,235, Cl. 250-282.000.

McKay, Dwight L.: *See*—
Mark, Harold W.; Bertus, Brent J.; Roberts, John S.; McKay, Dwight L.; and Fenska, Lyle E., 4,535,066, Cl. 502-62.000.

McKeel, Daniel W.: *See*—
Sakash, George; Grier, Robert K., Jr.; Stern, Hanajoerg; Dada, Abdul G.; and McKeel, Daniel W., 4,534,301, Cl. 110-255.000.

McKeough, David T.: *See*—
Ambrose, Ronald R.; Chang, Wen-Hsuan; McKeough, David T.; Eslinger, Delano R.; and Porter, Samuel, Jr., 4,535,132, Cl. 525-443.000.

McKnight, Thomas J. Tug type vessel. 4,534,738, Cl. 440-61.000.

McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., to Wirtz Manufacturing Company, Inc. Machine for continuously casting battery grids. 4,534,404, Cl. 164-429.000.

McManis, George E., III; Fletcher, Aaron N.; and Miles, Melvin H., to United States of America, Navy. Lithium-boron anodes in nitrate thermal battery cells. 4,535,037, Cl. 429-103.000.

McNulty, Chris. Adjustable wrench. 4,534,246, Cl. 81-111.000.

McQuire, David P.: *See*—
Castleman, Bruce W.; McQuire, David P.; and Szonntagh, Eugene L., 4,534,777, Cl. 55-181.000.

McVay, William P.: *See*—
Golden, Donald M.; and McVay, William P., 4,534,350, Cl. 128-334.00C.

Mead Corporation, The: *See*—
Adair, Paul C.; and Adkins, David G., 4,535,050, Cl. 430-138.000.
Kistner, Oscar J., 4,534,753, Cl. 493-453.000.

Meade, Steven L.: *See*—
Morris, Merle E.; Meade, Steven L.; and Rice, Lawrence M., 4,535,268, Cl. 313-569.000.

Mediolanum Farmaceutici S.R.L.: *See*—
Fravolini, Arnaldo, 4,535,079, Cl. 514-225.000.

Meier, Douglas R.: *See*—
Consay, Joseph A.; and Meier, Douglas R., 4,534,134, Cl. 51-96.000.

Meier, Urs: *See*—
Hanseler, Urs; Meier, Urs; and Muther, Franz, 4,534,472, Cl. 211-41.000.

Mekjian, Aram, to United States Steel Corporation. Polyester formulations having flexibility properties. 4,535,146, Cl. 528-295.300.

Melamed, Anna: *See*—
Harvest, Nils-Ole; and Melamed, Anna, 4,535,280, Cl. 318-798.000.

Melis, Jurgen: *See*—
Weirich, Walter; Melis, Jurgen; and Wollenhaupt, Peter, 4,534,584, Cl. 285-24.000.

Melling, Hugh: *See*—
Rothfuss, Robert G.; Kuhl, David K.; Bilotti, Federico; Melling, Hugh; and Mills, Earl J., 4,534,351, Cl. 128-334.00R.

Melnor Industries, Inc.: *See*—
Chow, Ho; and Goodman, Sidney J., 4,534,512, Cl. 239-394.000.

Meloni, Robert A., to General Instrument Corp. Dot matrix print head. 4,534,287, Cl. 101-93.050.

Meltzer, Peter C.; and Coe, Jotham W., to Key Pharmaceuticals, Inc. Process for making 6-desoxy-6-methylenenaloxone and 6-desoxy-6-methylenenaltrexone. 4,535,157, Cl. 546-44.000.

Mercadier, Michel: *See*—
Favie, Claude; and Mercadier, Michel, 4,535,130, Cl. 525-327.300.

Merck & Co., Inc.: *See*—
Di Pardo, Robert M.; and Bock, Mark G., 4,535,164, Cl. 548-187.000.
Freidinger, Roger M., 4,535,167, Cl. 548-344.000.
Kang, Kenneth S.; and Veeder, George T., 4,535,153, Cl. 536-123.000.
Rokach, Joshua, 4,535,171, Cl. 549-12.000.
Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Wakazawa, Tadashi; Niida, Taro; and Christensen, Burton G., 4,534,898, Cl. 260-245.300.

Merckaert, Louis: *See*—
Nicolas, Edgard; and Merckaert, Louis, 4,534,837, Cl. 204-129.000.

Merkt, Robert: *See*—
Elischer, Stefan; Hobel, Hans-Gunther; Merkt, Robert; and Wagner, Fritz, 4,535,160, Cl. 544-191.000.

Merry, Glenn W.: *See*—
Kelm, Roger W.; Merry, Glenn W.; and McArthur, William J., 4,535,036, Cl. 429-99.000.

Merten, Rudolf: *See*—
Sirinyan, Kirkor; Merten, Rudolf; an Giesecke, Henning, 4,535,032, Cl. 428-629.000.

Merz, Craig. Method and system for monitoring faults in electrical circuits. 4,535,321, Cl. 340-520.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Kuckein, Wilfried; Mylius, Albert; Bechtel, Peter; and Hofer, Adalbert, 4,535,017, Cl. 428-77.000.

Mestroni, Giovanni; Zassinovich, Grazia; and Alessio, Enzo, to Montedison S.p.A. Process for catalytically reducing nitroaromatic compounds. 4,535,162, Cl. 546-159.000.

Metallwerk Max Brose GmbH & Co.: *See*—
Hess, Peter; Schulz, Volkmar; and Rampel, Hans, 4,534,534, Cl. 248-424.000.

Methode Electronics, Inc.: *See*—
Brown, Vincent B.; and Schreiner, Donald G., 4,534,098, Cl. 29-564.800.
Brown, Vincent B.; and Geib, Lawrence, 4,534,603, Cl. 339-17.00C.

Metzger, Frederick B.; and Magliozzi, Bernard, to United Technologies Corporation. Cabin noise suppression in propeller driven aircraft. 4,534,526, Cl. 244-38.000.

Metzger, Karl G.: *See—*
Benz, Gunter; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,535,083, Cl. 514-274.000.

Metzler, Richard B.: *See—*
Foster, George N.; and Metzler, Richard B., 4,535,113, Cl. 524-262.000.

Meunier, Bernard, to Compagnie Generale de Constructions Telephoniques. Loop-circuit for telephone line. 4,535,202, Cl. 179-18.0FA.

Meunier, Jean; and Salesse, Marc, to Cegedur Societe de Transformation de L'Aluminium Pechiney. Process for sintering aluminum alloy powders under pressure. 4,534,937, Cl. 419-42.000.

Meyer, John J.; and Barth, Stanley D., to Nooter Corporation. Method and apparatus for joining a tube to a tubesheet. 4,535,214, Cl. 219-60.200.

Meyer Label Co., Inc.: *See—*
Freling, Martin, 4,535,018, Cl. 428-79.000.

Meyer, Rolf-Volker: *See—*
Ebert, Wolfgang; Meyer, Rolf-Volker; Idel, Karsten-Josef; and Dhein, Rolf, 4,535,149, Cl. 528-388.000.

Meyer, Thomas N.: *See—*
Wolf, Charles B.; Meyer, Thomas N.; Fey, Maurice G.; and Heidrich, John E., 4,535,225, Cl. 219-383.000.

Meyer, Timmy R.: *See—*
de Lorenzo, Mark X.; Hoffpauir, Charles R.; Hutchins, Johnnie R.; Meyer, Timmy R.; Page, John E.; and Poehl, Michael E., 4,535,134, Cl. 526-88.000.

Meynier, Guy, to Societe Anonyme D. B. A. Brake-pressure generator system. 4,534,170, Cl. 60-547.100.

Michelbrink, Bernhard: *See—*
Buchmuller, Horst; and Michelbrink, Bernhard, 4,534,299, Cl. 110-165.00R.

Micheron, Francois: *See—*
Ravinet, Pierre; Claudepierre, Christian; Guillou, Denis; and Micheron, Francois, 4,535,205, Cl. 179-110.00A.

Micinski, Eugene: *See—*
Kortovich, James W.; and Micinski, Eugene, 4,534,951, Cl. 423-448.000.

Micro-Mega: *See—*
Seigneurin, Michel; and Blanc, Roger, 4,534,733, Cl. 433-122.000.

Microbot, Inc.: *See—*
Hill, John W.; and Sword, Anthony J., 4,535,405, Cl. 364-400.000.

Microdesign Limited: *See—*
Arn, Robert M.; Csanky, Peter H.; and Waszek, Glen F., 4,535,355, Cl. 358-123.000.

Middleton, William J., to Du Pont de Nemours, E. I., and Company. Tris(disubstituted amino)sulfonium perfluorocarbanion salts. 4,535,184, Cl. 564-102.000.

Midland, Richard W., to Zenith Electronics Corporation. Transformerless switching circuit for driving a horizontal output transistor. 4,535,273, Cl. 315-401.000.

Midon Engineered Products, Inc.: *See—*
Mowat, Donald J.; and Doman, H. Michael, 4,534,438, Cl. 180-209.000.

Midwest Irrigation and Foundation, Inc.: *See—*
Goines, Fredrick J.; and Reifsteck, David A., 4,534,143, Cl. 52-169.500.

Miguel, Marvin E., to J. A. Freeman & Son, Inc. Self-propelled agricultural vehicle for picking up and transporting large bales of hay. 4,534,691, Cl. 414-38.000.

Mihara, Shin-ichi, to Olympus Optical Co., Ltd. Large relative aperture telephoto lens system. 4,534,626, Cl. 350-454.000.

Miki, Yukio; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Mounting and demounting device of optical unit. 4,534,621, Cl. 350-257.000.

Milberger, Lionel J.; Martin, Jimmy R.; and Mataway, Thomas P., to Combustion Engineering, Inc. Mudline casing hanger assembly. 4,534,583, Cl. 285-24.000.

Miles Laboratories, Inc.: *See—*
Lembach, Kenneth J., 4,534,972, Cl. 424-86.000.

Miles, Melvin H.: *See—*
McManis, George E., III; Fletcher, Aaron N.; and Miles, Melvin H., 4,535,037, Cl. 429-103.000.

Milkovic, Miran, to General Electric Company. Electronic watt/watthour meter with automatic error correction and high frequency digital output. 4,535,287, Cl. 324-142.000.

Miller, Edward B.; and Eichelberger, Charles W., to General Electric Company. Method and apparatus for controlling distributed electrical loads. 4,535,332, Cl. 340-825.060.

Miller, Jack V., to Gravity Guidance, Inc. Full body weight traction device. 4,534,554, Cl. 272-144.000.

Miller-Jones, Stockton M.; and Flax, Stephen W., to General Electric Company. Method and means for determining frequency selective tissue attenuation in a baseband ultrasonic imaging system. 4,534,359, Cl. 128-660.000.

Miller, Leroy J.: *See—*
Brault, Robert G.; and Miller, Leroy J., 4,535,054, Cl. 430-325.000.

Millipore Corporation: *See—*
Dourdeville, Theodore A.; and Lymneos, Anthony, 4,534,659, Cl. 366-338.000.

Mills, Earl J.: *See—*
Rothfuss, Robert G.; Kuhl, David K.; Bilotti, Federico; Melling, Hugh; and Mills, Earl J., 4,534,351, Cl. 128-334.00R.

Mills, George A. Apparatus and method for processing fruit and the like. 4,534,470, Cl. 209-585.000.

Milne, John D. Electrical anti-short bushing. 4,535,196, Cl. 174-83.000.

Mimura, Yoshiki; Arai, Tetsuji; Shimizu, Hiroshi; and Fukuda, Satoru, to Ushio Denki Kabushiki Kaisha. Heater assembly and a heat-treatment method of semiconductor wafer using the same. 4,535,228, Cl. 219-411.000.

Mina, Kent V.: *See—*
Buzzard, Clair A.; and Mina, Kent V., 4,535,454, Cl. 370-110.200.

Minai, Masayoshi; and Katsura, Tadashi, to Sumitomo Chemical Company, Limited. Process for preparing 2-cyclopentenone esters. 4,535,182, Cl. 560-231.000.

Minikane, Tomiharu, to Kabushiki Kaisha Toshiba. Photometric biochemical analyzer. 4,534,651, Cl. 356-440.000.

Minnesota Mining and Manufacturing Company: *See—*
Barrows, Thomas H., 4,534,349, Cl. 128-334.00R.
Frenchik, Robert A., 4,535,056, Cl. 430-542.000.
May, David C., 4,534,673, Cl. 404-14.000.
Niles, Gerald J.; and Sandberg, Thomas A., 4,535,432, Cl. 369-72.000.
Zarr, Myron, 4,534,523, Cl. 242-192.000.

Minolta Camera Co., Ltd.: *See—*
Ito, Masazumi; and Nagata, Kenzo, 4,535,463, Cl. 377-8.000.

Minolta Camera Kabushiki Kaisha: *See—*
Miki, Yukio; and Egawa, Takeshi, 4,534,621, Cl. 350-257.000.

Minzghor, Karsten R.: *See—*
Little, Edwin D.; and Minzghor, Karsten R., 4,534,954, Cl. 423-515.000.

Mirikidani, Tatsumi, to Nissan [illegible] Company, Limited. Exhaust monitoring sensor for a closed [illegible] fuel ratio control system of a multiplex exhaust manifold [illegible] 4,213, Cl. 73-118.000.

Mischenko, John, III: *See—*
Pall, David B.; Degen, Peter J. and Mischenko, John, III, 4,534,388, Cl. 141-1.000.

Mr. Gasket Company: *See—*
May, Richard L., 4,535,397, Cl. 362-369.000.

Mita Industrial Co., Ltd.: *See—*
Higashiguchi, Teruaki; and Miyakawa, Nobuhiro, 4,535,044, Cl. 430-58.000.
Honda, Nobuyasu; Yamakawa, Toshiro; and Ikeda, Toshimitsu, 4,535,049, Cl. 430-137.000.

Mitarai, Tsuyoshi, to Casio Computer Co., Ltd. Electronic musical instrument. 4,534,257, Cl. 84-1.030

Mitcham, John P.; and Karr, Michael A., Jr., to Gray Tool Company. Rotary stepper actuator. 4,534,235, Cl. 74-128.000.

Mitchell, Hal D.; Glover, Richard W.; Walker, Donald R.; and Rosenberg, Isadore, to Figgie International Inc. Shock attenuation system. 4,534,068, Cl. 2-414.000.

Mitchell, Randall M., to Caterpillar Tractor Co. Hydrostatic vehicle control. 4,534,707. Cl. 417-34.000.

Mitchell, Roger E.: *See—*
Arbisi, Dominic; and Mitchell, Roger E., 4,535,279, Cl. 318-696.000.

Mitsubishi Chemical Industries, Ltd.: *See—*
Goko, Nobuaki; and Uehara, Yumito, 4,534,953, Cl. 423-492.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Hashimoto, Masahide; Kurisu, Yoshitaka; Zuiki, Shigeo; and Sasaki, Yoshio, 4,534,183, Cl. 62-374.000.
Kiso, Mataichiro; Futakawa, Akemi; and Fukunaga, Tokio, 4,534,206, Cl. 73-12.000.
Okumoto, Shigeki, 4,534,750, Cl. 474-261.000.
Ootsuka, Kenichi; and Miyake, Yoshikazu, 4,535,253, Cl. 307-9.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Hiramatsu, Takeo, 4,534,244, Cl. 74-869.000.
Kobayashi, Kazuyoshi; and Takizawa, Shozo, 4,534,580, Cl. 280-712.000.
Murakami, Nobuaki; and Oomori, Shogo, 4,534,334, Cl. 123-571.000.

Mitsubishi Jukogyo Kabushiki: *See—*
Watabe, Shin; and Shibata, Hideto, 4,534,410, Cl. 165-126.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Ishitani, Kenichiro; Unseki, Takashi; Amiboshi, Saburo; and Kawamura, Eiichi, 4,534,569, Cl. 277-27.000.
Kiyoto, Shinichiro; and Fujiwara, Chikara, 4,534,196, Cl. 72-61.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Handa, Ryoji; Hosoda, Jun; and Yoshida, Norimasa, 4,535,131, Cl. 525-369.000.

Mitsuishi Fukai Tekkosho Ltd.: *See—*
Iwasaki, Shigeo; and Haguchi, Hiroshi, 4,534,721, Cl. 425-73.000.

Mitsuishi, Toshiro: *See—*
Matsuda, Minoru; and Mitsuishi, Toshiro, 4,534,322, Cl. 123-55.00R.

Mittleman, Herbert; and Sulek, Stanislaw, to Trimedyne, Inc. Sequential medication delivery device. 4,534,764, Cl. 604-81.000.

Miura, Kunihiko; Takano, Shouji; and Kimura, Masashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrophotographic copying apparatus for effecting a copying operation on the basis of a set copying characteristic. 4,534,642, Cl. 355-14.00E.

Miura, Shin'ichi: *See—*
Shinya, Ryohei; Miura, Shin'ichi; and Aozuka, Rikio, 4,534,312, Cl. 118-666.000.

Miwa, Hirohide: *See—*
Kleeper, John R.; Reid, John M.; Miwa, Hirohide; Shimura, Takaki; and Murakami, Keiichi, 4,534,220, Cl. 73-599.000.

Miyagawa, Akira: *See—*
Kano, Kuniomi; Fushimoto, Hideo; Sekine, Kazumi; Miyagawa, Akira; Hirata, Osamu; and Nishimuro, Yoshiaki, 4,535,416, Cl. 364-715.000.

Miyahara, Hatsuo: *See*—
Nozaki, Shigeki; and Miyahara, Hatsuo, 4,535,423, Cl. 365-51.000.
Miyakawa, Nobuhiro: *See*—
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Miyake, Yoshikazu: *See*—
Ootsuka, Kenichi; and Miyake, Yoshikazu, 4,535,253, Cl. 307-9.000.
Mizoguchi, Mitsuru: *See*—
Takaishi, Kazuhide; Kadonaga, Toshiki; Tamura, Masamitsu; Nakamura, Shigeharu; Mizoguchi, Mitsuru; Hirota, Yoshinobu; and Yamazaki, Yukinobu, 4,534,199, Cl. 72-276.000.
Mizuguchi, Shunji: *See*—
Tanaka, Minoru; Nakamura, Hideo; and Mizuguchi, Shunji, 4,535,009, Cl. 427-246.000.
Mlins PLC: *See*—
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Mobay Chemical Corporation: *See*—
Price, Ronald L.; Witman, Mark W.; and Krishnan, Sivaram, 4,535,143, Cl. 528-174.000.
Mobil Oil Corporation: *See*—
Horodysky, Andrew G.; and Kaminski, Joan M., 4,534,872, Cl. 252-32.70E.
Krutchen, Charles M.; and Wu, Wen-Pao, 4,535,100, Cl. 521-180.000.
Saliger, Kenneth C., 4,534,585, Cl. 285-92.000.
Schwab, Frederick C., 4,535,129, Cl. 525-316.000.
Mochida, Ei: *See*—
Ohnishi, Haruo; Kosuzume, Hiroshi; Suzuki, Yasuo; and Mochida, Ei, 4,534,966, Cl. 424-94.000.
Mochida Pharmaceutical Co., Ltd.: *See*—
Ohnishi, Haruo; Kosuzume, Hiroshi; Suzuki, Yasuo; and Mochida, Ei, 4,534,966, Cl. 424-94.000.
Modak, Shanta M.: *See*—
Fox, Charles L., Jr.; and Modak, Shanta M., 4,535,078, Cl. 514-157.000.
Moe, Walter: *See*—
Jones, Lawrence T.; Lee, Robert S.; Moe, Walter; Howden, Ashley G.; and Ishikawa, Paul J., 4,534,745, Cl. 446-398.000.
Moen, Walter K., to Rockwell International Corporation. Temperature control system. 4,535,222, Cl. 219-300.000.
Molina, Orlando G. Testing apparatus for quantitatively measuring creepability of liquids. 4,534,211, Cl. 73-64.400.
Molins PLC: *See*—
Harrington, Timothy C.; and Horsley, John K., 4,534,252, Cl. 83-310.000.
Monsanto Co.: *See*—
Beestman, George B., 4,534,783, Cl. 71-27.000.
Fisher, Don E.; and Wilkie, Arnold E., 4,534,161, Cl. 57-125.000.
Woodard, Scott S., 4,535,194, Cl. 570-236.000.
Montealegre, James W., to Container Corporation of America. Expandable food container. 4,534,505, Cl. 229-33.000.
Montedison S.p.A.: *See*—
Mestroni, Giovanni; Zassinovich, Grazia; and Alessio, Enzo, 4,535,162, Cl. 546-159.000.
Montgomery, William J. I. Personal alert signal. 4,535,392, Cl. 362-186.000.
Moon, Malcolm W., to Upjohn Company, The. Piperazinone, piperazine, 1,4-diazepin-2-one and 1,4-diazepine intermediate compounds. 4,534,897, Cl. 260-239.30R.
Moore, George G. I., to Riker Laboratories, Inc. Substituted diazoles and thiazoles. 4,535,165, Cl. 548-204.000.
Moore, Uri: *See*—
Kogan, Abraham; and Moore, Uri, 4,534,175, Cl. 60-649.000.
Morbark Industries, Inc.: *See*—
Morey, Norval K.; and Bateman, Ivor, 4,534,390, Cl. 144-373.000.
Morbitzer, Leo: *See*—
Binsack, Rudolf; Rempel, Dieter; Lindner, Christian; and Morbitzer, Leo, 4,535,124, Cl. 525-67.000.
More, Anton; Lang, Winfried; Riedle, Rudolf; Straussberger, Herbert; and Streckel, Willi, to Wacker-Chemie GmbH. Process for treating silicon and ferrosilicon with slag. 4,534,791, Cl. 75-10.00R.
Moreau, Dominique; Duchemin, Pierre; and Duchemin, Jean-Pierre, to La Telemecanique Electrique. Magneto-thermal device for overcurrent relays. 4,535,309, Cl. 335-42.000.
Morehouse, James H.: *See*—
Anderson, Kurt M.; and Morehouse, James H., 4,535,374, Cl. 360-103.000.
Morel, Michel, to Paget et Morel. Hinge for mounting spectacles. 4,534,628, Cl. 351-153.000.
Morey, Norval K.; and Bateman, Ivor, to Morbark Industries, Inc. Portable chipper with relatively low power high torque tree feed mechanism for feeding the tree or other product to be chipped at a controlled feed angle. 4,534,390, Cl. 144-373.000.
Morey, William A., to Rockwell International Corporation. Digitally controlled vector generator for stroke written CRT displays. 4,535,328, Cl. 340-739.000.
Mori, Hidefumi; and Ikeda, Masahiro, to Nippon Telegraph & Telephone Public Corporation. Method for manufacturing crystalline film. 4,534,820, Cl. 156-603.000.
Mori, Masahiko; Arai, Kenichiro; and Tezuka, Chikao, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Serial printer. 4,534,665, Cl. 400-145.200.
Moriguchi, Haruhiko; Omori, Takashi; and Inui, Toshiharu, to Fuji Xerox Co. Ltd. Method and apparatus for thermal printing. 4,535,340, Cl. 346-76.0PH.
Morimoto, Kiyoshi; and Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Photoelectromotive force element. 4,535,195, Cl. 136-261.000.
Morimoto, Masayuki: *See*—
Okihara, Naoto; Morimoto, Masayuki; and Ide, Tatsumi, 4,535,311, Cl. 335-124.000.
Morimoto, Yoshihiko: *See*—
Abe, Kunihiro; and Morimoto, Yoshihiko, 4,535,289, Cl. 324-208.000.
Morimura, Seiichiro: *See*—
Kimura, Kiyoshi; Morita, Iwao; and Morimura, Seiichiro, 4,535,073, Cl. 514-89.000.
Morioka, Kazumasa; and Yoshimi, Toru, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Method and apparatus for manufacturing cups having a lip. 4,534,927, Cl. 264-321.000.
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, to Lion Corporation. Micellar slug for oil recovery. 4,534,411, Cl. 166-274.000.
Morita, Iwao: *See*—
Kimura, Kiyoshi; Morita, Iwao; and Morimura, Seiichiro, 4,535,073, Cl. 514-89.000.
Morita, Takayuki: *See*—
Muramatsu, Shigeru; Asai, Isao; and Morita, Takayuki, 4,534,517, Cl. 242-35.50A.
Moritomi, Hiroshi: *See*—
Sanada, Yuzo; Yokoyama, Susumu; Chiba, Tadatoshi; Yokono, Tetsuro; Moritomi, Hiroshi; Obara, Toshiyuki; and Nagaishi, Hiroshi, 4,534,848, Cl. 208-10.000.
Moroto, Masayuki: *See*—
Asano, Hiroshige; and Moroto, Masayuki, 4,534,803, Cl. 134-30.000.
Morris, Merle E.; Meade, Steven L.; and Rice, Lawrence M., to GTE Products Corporation. High pressure tipless tungsten halogen lamp. 4,535,268, Cl. 313-569.000.
Morrisroe, John P. Artificial seaweed. 4,534,675, Cl. 405-24.000.
Morse, Randall H.: *See*—
Bacon, David L.; Kremer, Richard D.; and Morse, Randall H., 4,534,863, Cl. 210-232.000.
Moser, Hans, to Ciba-Geigy Corporation. Process for producing N-phosphonomethylglycine. 4,534,904, Cl. 260-502.50F.
Mosher, Oren A.; and Douglas, Ellwood S., to Package Machinery Co. Vibratory feeder control for a weighing system. 4,534,428, Cl. 177-1.000.
Moskovsky Nauchno-Issledovatelsky Institut Mirrokhirurgii Glaza: *See*—
Fedorov, Svyatoslav N.; Degtev, Evgeny I.; Golubev, Vladimir N.; Khromov, Sergei V.; Yatsenko, Igor A.; Karavaev, Alexandr A.; and Yakushev, Vladimir M., 4,534,348, Cl. 128-305.000.
Moss, Charles A.: *See*—
Parks, James D.; Moss, Charles A.; and Dyer, Kermit W., 4,534,281, Cl. 98-115.300.
Mostek Corporation: *See*—
Jiang, Ching-Lin, 4,535,427, Cl. 365-205.000.
Motorola, Inc.: *See*—
Macin, Bruce J.; and Bresin, Mark S., 4,534,208, Cl. 73-49.300.
Petrie, Adelore F., 4,535,464, Cl. 377-39.000.
Motter Printing Press Co.: *See*—
Rahe, Thomas E., 4,534,552, Cl. 271-279.000.
Motycka, David L.: *See*—
Fasano, Anthony; Roberts, John H.; and Motycka, David L., 4,534,216, Cl. 73-147.000.
Mouncher, John: *See*—
Hughes, John; and Mouncher, John, 4,535,204, Cl. 179-90.0BD.
Mountain, Peter J., to British Telecommunications. Digital transmission systems. 4,535,446, Cl. 370-68.000.
Mowat, Donald J.; and Doman, H. Michael, to Midon Engineered Products, Inc. Motorized vehicles. 4,534,438, Cl. 180-209.000.
Mowry, Gregory S; and George, Peter K., to Magnetic Peripherals, Inc. Magnetoresistive head. 4,535,375, Cl. 360-113.000.
Moyer, Wendell W.: *See*—
van Konynenburg, Peter H.; Lyons, Bernard J.; Smith-Johannsen, Robert; and Moyer, Wendell W., 4,534,889, Cl. 252-511.000.
MTU-Motoren-und Turbinen-Union Friedrichshafen GmbH: *See*—
Deutschmann, Herbert; and Dinger, Hans, 4,534,324, Cl. 123-90.220.
Mueller, Warren B., to Ethyl Corporation. Polyphosphazene compounding process. 4,535,095, Cl. 521-89.000.
Muller, Hans, to Chemap AG. Apparatus for growing microorganisms. 4,535,062, Cl. 435-289.000.
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Munoz-Bustamante, Carlos: *See*—
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Shibahara, Seiji; Okonogi, Tsuneo; Murai, Yasushi; Fukatsu, Shunzo; Wakazawa, Tadashi; Niida, Taro; and Christensen, Burton G., 4,534,898, Cl. 260-245.300.
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Murakami, Nobuaki; and Oomori, Shogo, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Exhaust-gas recirculation system for internal combustion engine. 4,534,334, Cl. 123-571.000.
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Murase, Shigemitsu. Method of treating polyester material for rubber reinforcement. 4,535,107, Cl. 524-157.000.
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Shiomi, Tadataka; Nabika, Kouichi; and Kawagoe, Takashi, 4,534,692, Cl. 414-282.000.
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Yoneda, Yasunobu, 4,535,064, Cl. 501-138.000.
Mushovic, John N.: *See*—
Peacock, Bobbie D.; Mushovic, John N.; and Geyer, Roger D., 4,534,225, Cl. 73-860.000.
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Husbands, G. E. Morris; Yardley, John P.; and Muth, Eric A., 4,535,186, Cl. 564-336.000.
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Kuckein, Wilfried; Mylius, Albert; Bechtel, Peter; and Hofer, Adalbert, 4,535,017, Cl. 428-77.000.
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Koene, Casper H.; Vos, Cornelis; and Brasser, Jan, 4,534,983, Cl. 426-293.000.
Naarmann, Herbert; and Koehler, Gernot, to BASF Aktiengesellschaft. Battery or electrochemical store based on electrochemically oxidizable and/or reducible polymers. 4,535,039, Cl. 429-213.000.
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Ito, Masazumi; and Nagata, Kenzo, 4,535,463, Cl. 377-8.000.
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Yamaguchi, Tadahiro; and Naito, Ryuichi, 4,535,306, Cl. 331-23.000.
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Izumi, Takayuki; Naito, Tsutomu; and Nakamura, Tomoo, 4,534,850, Cl. 208-22.000.
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Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,535,085, Cl. 514-290.000.
Naitoh, Yoshihiro: *See*—
Matsuoka, Shigeki; and Naitoh, Yoshihiro, 4,534,801, Cl. 134-15.000.
Naka, Yasushi; and Kawakami, Kiyoshi. Moisture-permeable waterproof coated fabric having a microporous polyurethane layer. 4,535,008, Cl. 427-246.000.
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Ito, Tadashi; Isobe, Yasuo; Ito, Fumio; and Nakamoto, Soichi, 4,534,640, Cl. 354-448.000.
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Nakamura, Ichiro: *See*—
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Nakamura, Kosei; and Takano, Yoshikazu, to Fanuc Ltd. Spindle head unit. 4,534,686, Cl. 409-135.000.
Nakamura, Shigeharu: *See*—
Takaishi, Kazuhide; Kadonaga, Toshiki; Tamura, Masamitsu; Nakamura, Shigeharu; Mizoguchi, Mitsuru; Hirota, Yoshinobu; and Yamazaki, Yukinobu, 4,534,199, Cl. 72-276.000.
Nakamura, Takashi: *See*—
Arakawa, Satoshi; Nakamura, Takashi; and Takahashi, Kenji, 4,534,884, Cl. 252-301.40H.
Takahashi, Kenji; and Nakamura, Takashi, 4,535,237, Cl. 250-327.200.
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Nakamuta, Masamichi. Method and apparatus for manufacturing bean curd. 4,534,283, Cl. 99-468.000.
Nakano, Gregory S.: *See*—
Wilger, John F.; Nakano, Gregory S.; Orillo, Stephen, Jr.; and Cazinha, John R., 4,534,135, Cl. 51-241.00S.
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Nakayama, Jingo: *See*—
Yamamura, Yukio; Nakayama, Jingo; Ikeda, Atsunobu; and Kawamoto, Takashi, 4,534,590, Cl. 297-180.000.
Nakazato, Takuzo; Okuto, Koichiro; and Kai, Toshio, to Sumitomo Metal Industries, Ltd. Offshore structure and method of constructing same. 4,534,678, Cl. 405-204.000.
Nara, Kiyoshi; Katamoto, Kazuyoshi; and Ohta, Kazuhiko, to Takeda Chemical Industries, Ltd. Method for separating cephalosporins. 4,535,155, Cl. 544-20.000.
Natarajan, Sesha I.; and Gordon, Eric M., to E. R. Squibb & Sons, Inc. Intermediates for substituted peptide compounds. 4,535,176, Cl. 560-27.000.
National Can Corporation: *See*—
Snyder, Walter W., 4,534,202, Cl. 72-349.000.
National Company Air France, The: *See*—
Lucien, Staub, 4,534,594, Cl. 297-438.000.
National Semiconductor Corporation: *See*—
Goodrich, Gary B.; and Belani, Jadish G., 4,535,350, Cl. 357-74.000.
Szepesi, Tamas S., 4,535,399, Cl. 363-41.000.
National Starch and Chemical Corporation: *See*—
Schoenberg, Jules E.; Flanagan, Thomas P.; and Ray-Chaudhuri, Dilip K., 4,535,140, Cl. 526-329.000.
Sedran, Roger H., 4,534,493, Cl. 222-146.200.
Naunapper, Dietmar; and Braun, Gunter, to Glatt GmbH. Device for use in fluidized bed techniques and its method of use. 4,535,006, Cl. 427-213.000.
Nautical Electronics Laboratories Limited: *See*—
Covill, Dennis H., 4,535,298, Cl. 330-189.000.
NCR Corporation: *See*—
Dham, Vinod K.; Honnigford, Edward H.; Stewart, John K., Jr.; Pfeifer, Robert F.; and Trudel, Murray L., 4,534,104, Cl. 29-571.000.
Neale, Douglas L., to Federal Paper Board Co., Inc. Blank for carton for holding and dispensing plastic film. 4,534,497, Cl. 225-25.000.
NEC Corporation: *See*—
Okihara, Naoto; Morimoto, Masayuki; and Ide, Tatsumi, 4,535,311, Cl. 335-124.000.
Neefe, Charles W. Method of controlling the ultraviolet polymerization of spin cast lenses. 4,534,915, Cl. 264-1.400.
Nekoosa Envelopes, Inc.: *See*—
Engh, Gordon L., 4,534,581, Cl. 281-15.00R.
Nelson, James A.; and Zimmer, Robert E., to Buehler Ltd. Apparatus for mounting samples for polishing. 4,534,536, Cl. 249-83.000.
Nelson, Peter E., to Ivac Corporation. Fault detection apparatus and method for parenteral infusion system. 4,534,756, Cl. 604-50.000.
Nesta, Charles: *See*—
Gilliland, W. Keith; Hart, Lawrence M.; and Nesta, Charles, 4,534,641, Cl. 355-3.00R.
Nestec S.A.: *See*—
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Neukam, Theo: *See*—
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New Cosmos Electric Co., Ltd.: *See*—
Sakai, Sai, 4,535,315, Cl. 338-34.000.
New England Ropes, Inc.: *See*—
Schuerch, Peter E., 4,534,163, Cl. 57-233.000.
Newberg, Barry M., to Emerson Electric Co. Dynamoelectric machine having means for draining water from endshield. 4,535,262, Cl. 310-88.000.
Newburg, Betty, executrix: *See*—
Newburg, Norman R., deceased, 4,535,097, Cl. 521-139.000.
Newburg, Norman R., deceased (by Newburg, Betty, executrix), to Hercules Incorporated. Cellular thermoset poly (dicyclopentadiene). 4,535,097, Cl. 521-139.000.

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Newell, Alfred T., III; and Newell, Alfred T., Jr., 4,534,406, Cl. 165-12.000.
Newell, Alfred T., III; and Newell, Alfred T., Jr., to A. T. Newell Co. Inc. Thermostat. 4,534,406, Cl. 165-12.000.
Newsome, Reginald W., to Philip Morris Incorporated. Roll-your-own cigarette maker. 4,534,367, Cl. 131-75.000.
Neyer, Leo E.: *See—*
Simpson, Harold G.; and Neyer, Leo E., 4,534,148, Cl. 52-640.000.
Ng, Min-Hing, to Concord Tool and Machine Company. Collapsible kitchen utensil holder. 4,534,474, Cl. 211-70.000.
NGK Insulators, Ltd.: *See—*
Matsuhiro, Keiji; and Matsui, Minoru, 4,535,063, Cl. 501-97.000.
Nguyen, Chien, to Stromberg-Carlson Corp. Voltage regulation circuit. 4,535,282, Cl. 323-269.000.
Nicolas, Edgard; and Merckaert, Louis, to Solvay & Cie. Process for the manufacture of an electrode for electrochemical processes and a cathode for the electrolytic production of hydrogen. 4,534,837, Cl. 204-129.000.
Nielsen, Marshall G., to United States of America, Energy. Water displacement mercury pump. 4,534,709, Cl. 417-65.000.
Nigorikawa, Kazunori: *See—*
Sugimori, Shigeru; Kojima, Tetsuhiko; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, 4,534,883, Cl. 252-299.630.
Nihon Nohyaku Co., Ltd.: *See—*
Kurono, Hitoshi; Taninaka, Kuniaki; Sugimoto, Tatsuyoshi; and Katoh, Minoru, 4,535,075, Cl. 514-96.000.
Nihon Sanso Kabushiki Kaisha: *See—*
Kitayama, Masayasu; Sugimori, Yoshiaki; and Ohta, Schunich, 4,535,072, Cl. 502-411.000.
Takahashi, Masashi; and Yamada, Minoru, 4,534,914, Cl. 261-64.00B.
Nihon Tokushu Noyaku Seizo K.K.: *See—*
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,535,076, Cl. 514-128.000.
Niida, Taro: *See—*
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Niimi, Tomohide: *See—*
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Nijman, Aloysius J.: *See—*
Schoofs, Franciscus A. C. M.; and Nijman, Aloysius J., 4,535,303, Cl. 330-297.000.
Niles, Gerald J.; and Sandberg, Thomas A., to Minnesota Mining and Manufacturing Company. Device for cleaning a phonograph record. 4,535,432, Cl. 369-72.000.
Nilsson, Thorsten, to Tetra Pak International AB. Guiding and braking unit for a material web. 4,534,498, Cl. 226-181.000.
Nippon Cable System Inc.: *See—*
Hamaguchi, Osamu, 4,534,233, Cl. 74-89.200.
Nippon Electric Co., Ltd.: *See—*
Hareyama, Kyuichi, 4,535,257, Cl. 307-362.000.
Nippon Infrared Industries Co., Ltd.: *See—*
Inoue, Hitosi; Suenaga, Norihiro; and Suenaga, Nobuyuki, 4,535,458, Cl. 372-25.000.
Nippon Kogaku K. K.: *See—*
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Nippon Oil Co., Ltd.: *See—*
Uemura, Seiichi; Hirose, Takao; and Sohda, Yoshio, 4,534,950, Cl. 423-447.400.
Nippon Oil and Fats Company Limited: *See—*
Takeuchi, Fumio; Takahashi, Masao; Hattori, Katsuhide; and Sakai, Hiroshi, 4,534,809, Cl. 149-3.000.
Nippon Shinyaku Co Limited: *See—*
Kimura, Kiyoshi; Morita, Iwao; and Morimura, Seiichiro, 4,535,073, Cl. 514-89.000.
Nippon Steel Corporation: *See—*
Zaizen, Takashi; Otoguro, Yasuo; Yamanaka, Mikio; and Yamane, Shozo, 4,535,034, Cl. 428-653.000.
Nippon Telegraph & Telephone Public Corporation: *See—*
Mori, Hidefumi; and Ikeda, Masahiro, 4,534,820, Cl. 156-603.000.
Nippon Television Network Corporation: *See—*
Nakagawa, Koichi; Sugimori, Yoshio; Kimata, Yoshihide; Araki, Yosai; and Arai, Tomoji, 4,535,356, Cl. 358-145.000.
Nishii, Michiharu, to Aisin Seiki Kabushiki Kaisha. Vacuum booster assembly. 4,534,270, Cl. 91-376.00R.
Nishikage, Tadao: *See—*
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,535,120, Cl. 524-560.000.
Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Yoshizawa, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Vibration and noise reduction means for a transmission vehicle. 4,534,236, Cl. 74-364.000.
Nishikawa, Tomoyasu: *See—*
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Nishimuro, Yoshiaki: *See—*
Kano, Kuniomi; Fushimoto, Hideo; Sekine, Kazumi; Miyagawa, Akira; Hirata, Osamu; and Nishimuro, Yoshiaki, 4,535,416, Cl. 364-715.000.
Nishizawa, Masahiro: *See—*
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Nissan Motor Co., Ltd.: *See—*
Kamijo, Ken; and Uekusa, Yasuyuki, 4,534,441, Cl. 180-268.000.
Kato, Manabu; and Aoyama, Shunichi, 4,534,323, Cl. 123-90.160.
Mirikidani, Tatsumi, 4,534,213, Cl. 73-118.000.
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, 4,534,435, Cl. 180-140.000.
Nisshin Oil Mills, Ltd.: *See—*
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Nitto Kagaku Kabushiki Kaisha: *See—*
Handa, Ryoji; Hosoda, Jun; and Yoshida, Norimasa, 4,535,131, Cl. 525-369.000.
NL Sperry-Sun, Inc.: *See—*
Russell, Anthony W.; and Russell, Michael K., 4,535,429, Cl. 367-85.000.
Noda, Atsushi, to Canon Kabushiki Kaisha. Recording apparatus. 4,535,344, Cl. 346-139.00D.
Noe, Andreas: *See—*
Noe, Oskar; Noe, Andreas; and Noe, Rolf, 4,534,198, Cl. 72-201.000.
Noe, Oskar; Noe, Andreas; and Noe, Rolf, to BWG Bergwerk - und Walzwerk-Maschinenbau GmbH. Cooling hot-rolled steel strip. 4,534,198, Cl. 72-201.000.
Noe, Rolf: *See—*
Noe, Oskar; Noe, Andreas; and Noe, Rolf, 4,534,198, Cl. 72-201.000.
Nohara, Shigezo, to Toyo Seikan Kaisha, Ltd. Process for producing stretched multilayer polyester bottle. 4,534,930, Cl. 264-513.000.
Nohda, Masao, to Nippon Kogaku K. K. Automatic lens meter. 4,534,645, Cl. 356-125.000.
Nohria, Naresh K.: *See—*
Jindrick, James A.; Dolnik, Thomas G.; Nohria, Naresh K.; Gilker, Clyde; Hurley, James R.; Dunk, Michael P.; Reis, Norbert J.; and Bray, Thomas J., 4,535,409, Cl. 364-481.000.
Nomura, Noboru; Hirota, Eiichi; and Wasa, Kiyotaka, to Matsushita Electric Industrial Co., Ltd. Magnetic head incorporating an amorphous magnetic metallic film having a thickness equal to a track width. 4,535,376, Cl. 360-126.000.
Nooter Corporation: *See—*
Meyer, John J.; and Barth, Stanley D., 4,535,214, Cl. 219-60.200.
Nordale Incorporated: *See—*
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Nordson Corporation: *See—*
Simashkevich, Richard M.; and Sharp, William J., 4,534,106, Cl. 29-613.000.
Norizuki, Senichiro: *See—*
Yamamoto, Osamu; and Norizuki, Senichiro, 4,534,108, Cl. 7-152.000.
Norrstrom, Hans; and Idner, Kristina, to AGA Aktiebolag. Method for producing chemimechanical high yield pulp using an oxygen alkali treatment followed by an oxygen mechanical defibration. 4,534,397, Cl. 162-23.000.
North American Philips Consumer Electronics Corp.: *See—*
Say, Donald L., 4,535,266, Cl. 313-414.000.
Northern Telecom Limited: *See—*
Bura, Paul, 4,535,304, Cl. 330-300.000.
Kasbia, Puran S.; and Li, Yuan-Lu, 4,535,201, Cl. 179-18.0FA.
Znojkiewicz, Maciej E., 4,535,308, Cl. 333-232.000.
Norton, Henry J.; and Urion, Kenard E., to Scott Paper Company. Wet tissue dispensing port. 4,534,491, Cl. 221-63.000.
Novak, William J.; and McClung, Ronald G., to Engelhard Corporation. Apparatus for catalytic reforming with continuous sulfur removal. 4,534,943, Cl. 422-188.000.
Novatome: *See—*
Malaval, Claude, 4,534,140, Cl. 52-21.000.
Novi Development Corporation: *See—*
Kariakin, Joseph A., 4,534,924, Cl. 264-259.000.
Nowacki, Christopher; and Brisson, Alfred G., to Trutek Research, Inc. Metered dose inhaler. 4,534,343, Cl. 128-200.230.
Nowicki, Casimir W. Method and apparatus for packing plastic bottles. 4,534,153, Cl. 53-448.000.
Nozaki, Shigeki; and Miyahara, Hatsuo, to Fujitsu Limited. Semiconductor memory device. 4,535,423, Cl. 365-51.000.
NSK-Warner K.K.: *See—*
Yanagihara, Hideo, 4,534,520, Cl. 242-107.000.
Nuckols, Walter S.; Leonard, Walter G.; and Doble, Henry P., Jr. Calendar-oriented pill dispenser. 4,534,468, Cl. 206-534.000.
Numata, Norio: *See—*
Yokoya, Satoshi; Numata, Norio; and Shimizu, Ikuo, 4,535,470, Cl. 381-15.000.
Nygren, Ingemar K.: *See—*
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Nypro Inc.: *See—*
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Nystrom, Borje: *See—*
Hansen, Helge; Nystrom, Borje; and Torneng, Eyvin, 4,534,976, Cl. 514-169.000.
Oana, Yasuhisa: *See—*
Harada, Nozomu; Oana, Yasuhisa; Ogi, Keisuke; Izawa, Koji; Taya, Akira; and Sakamoto, Masanori, 4,534,622, Cl. 350-334.000.
Obara, Toshiyuki: *See—*
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Ochii, Kiyofumi; Masuda, Masami; and Kondo, Takeo, to Tokyo-Shibaura Denki Kabushiki Kaisha. Positive feedback amplifier circuitry. 4,535,255, Cl. 307-264.000.

Off, Joseph W. A.; and Ferguson, Vivian, to Train-A-Mation, Inc. Apparatus for sewing 360 degree pattern. 4,534,303, Cl. 112-114.000.

Ogasawara, Tsuyoshi; Ichiryu, Ken; Nakamura, Ichiro; and Kido, Yasuo, to Hitachi, Ltd. Hydraulic elevator. 4,534,452, Cl. 187-29.00A.

Ogawa, Kimiaki: *See*—
Tabata, Yasushi; Ogawa, Kimiaki; and Takahashi, Toshimitsu, 4,534,634, Cl. 354-268.000.

Ogawa, Masaki; and Shiomura, Yasuro, to Bridgestone Tire Co., Ltd. Surface modifying compositions for vulcanized rubber and method of modifying vulcanized rubber surface using the same. 4,535,003, Cl. 427-207.100.

Ogawara, Hiroshi: *See*—
Honda, Seiichirou; Ogawara, Hiroshi; and Fukuda, Mutsumi, 4,534,798, Cl. 106-266.000.

Ogi, Keisuke: *See*—
Harada, Nozomu; Oana, Yasuhisa; Ogi, Keisuke; Izawa, Koji; Taya, Akira; and Sakamoto, Masanori, 4,534,622, Cl. 350-334.000.

Ogihara, Masahiro: *See*—
Sakaguchi, Susumu; Itoh, Ken; Ogihara, Masahiro; Makigawa, Shinji; Ryuo, Toshihiko; and Watanabe, Kazuyoshi, 4,534,821, Cl. 156-617.0SP.

O'Hanlon, Thomas A.: *See*—
Reichman, James M.; O'Hanlon, Thomas A.; and Kendrew, Thomas J., 4,534,425, Cl. 175-53.000.

Ohara, Shunji: *See*—
Satoh, Isao; Yoshida, Tomio; Ohara, Shunji; and Koishi, Kenji, 4,535,439, Cl. 369-275.000.

Ohara, Tsunemasa; Suzuki, Masayuki; and Yamamichi, Masayoshi, to Canon Kabushiki Kaisha. Delay mechanism for single reflex camera. 4,534,633, Cl. 354-237.000.

Ohara, Yuji; and Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Method of and system for laser beam recording. 4,535,342, Cl. 346-108.000.

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Inaike, Toshihiro; Yamamoto, Shuji; Ohe, Shunji; and Otsuka, Kazunori, 4,535,105, Cl. 524-104.000.

Ohm, Edward A., to AT&T Bell Laboratories. Multibeam antenna arrangement. 4,535,338, Cl. 343-781.0CA.

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Ohnuki, Mitsuo, to Konishiroku Photo Industry Co., Ltd. Lens tube for a high vari-focal ratio zoom lens. 4,534,625, Cl. 350-429.000.

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Ohta, Schunich: *See*—
Kitayama, Masayasu; Sugimori, Yoshiaki; and Ohta, Schunich, 4,535,072, Cl. 502-411.000.

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Suzuki, Takashi; Matsumura, Susumu; and Ohtaka, Keiji, 4,534,637, Cl. 354-403.000.

Oiles Industry Co., Ltd.: *See*—
Maeda, Katsutoshi; and Shimoda, Ikuo, 4,534,535, Cl. 248-636.000.

Ojala, William K., to Practical Technology Incorporated. Vehicle seat lumbar support insert and method of utilizing the same. 4,534,593, Cl. 297-284.000.

Okada, Kazuo, to Kabushiki Kaisha Universal. Slot machine. 4,534,560, Cl. 273-143.00R.

Okazaki, Narukazu, to Wakayama Iron Works, Ltd. Dryer for a continuous textile fabric. 4,534,120, Cl. 34-119.000.

Okey, David W.: *See*—
Lee, Raymond; Okey, David W.; and Ferro, Gregory A., 4,535,099, Cl. 521-154.000.

OKI Electric Industry Co., Ltd.: *See*—
Nakagawa, Koichi; Sugimori, Yoshio; Kimata, Yoshihide; Araki, Yosai; and Arai, Tomoji, 4,535,356, Cl. 358-145.000.

Okihara, Naoto; Morimoto, Masayuki; and Ide, Tatsumi, to NEC Corporation. Contact support means for an electromagnetic relay. 4,535,311, Cl. 335-124.000.

Okonogi, Tsuneo: *See*—
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Okuma Machinery Works Ltd.: *See*—
Asano, Hiroshige; and Moroto, Masayuki, 4,534,803, Cl. 134-30.000.

Okumoto, Shigeki, to Mitsubishi Denki Kabushiki Kaisha. Automotive V-belt. 4,534,750, Cl. 474-261.000.

Okumura, Junji: *See*—
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Okuno, Toshinori; and Nakamura, Hiroshi, to Dengen Automatic Co. Ltd. Tile arranging apparatus for automatic game playing table. 4,534,561, Cl. 273-149.00R.

Okuto, Koichiro: *See*—
Nakazato, Takuzo; Okuto, Koichiro; and Kai, Toshio, 4,534,678, Cl. 405-204.000.

Olin Corporation: *See*—
Gates, William J.; and Zwirlein, John F., 4,534,802, Cl. 134-22.120.
Woodard, Kenneth E., Jr.; and Dotson, Ronald L., 4,534,846, Cl. 204-290.00R.

Olofinsky, Evgeny P.: *See*—
Bragin, Boris F.; Kolomiets, Alexandr S.; Korotkikh, Jury B.; Markuntovich, Felix D.; Olofinsky, Evgeny P.; Gladky, Petr V.; Perepletchikov, Evgeny F.; and Ekber, Boris Y., 4,534,540, Cl. 251-203.000.

Olschewski, Armin; and Bauer, Bernhard, to SKF Kugellagerfabriken GmbH. Cage for rolling bearings. 4,534,095, Cl. 29-148.40C.

Olson, David L.; and Marquez, Alfredo D., to Research Corporation. Cast iron welding materials and method. 4,534,793, Cl. 75-123.00N.

Olsson, Billy E., to AMP Incorporated. Connector for printed circuit boards. 4,534,606, Cl. 339-75.00M.

Olympus Optical Co., Ltd.: *See*—
Mihara, Shin-ichi, 4,534,626, Cl. 350-454.000.

O'Mara, Bradley E., to Intersil, Inc. Power supply failure early warning detector. 4,535,410, Cl. 364-483.000.

Omodei-Sale, Amedeo: *See*—
Galliani, Giulio; Omodei-Sale, Amedeo; Consonni, Pietro; and Assandri, Alessandro, 4,535,090, Cl. 514-383.000.

Omori, Takashi: *See*—
Moriguchi, Haruhiko; Omori, Takashi; and Inui, Toshiharu, 4,535,340, Cl. 346-76.0PH.

O'Neill, Charles E.: *See*—
Ambrose, John; Charles, Douglas K.; Conard, Bruce R.; Diaz, Carlos; O'Neill, Charles E.; and Leavoy, Wayne P., 4,534,935, Cl. 419-23.000.

Ono, Taizo: *See*—
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,534,978, Cl. 514-429.000.
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Ono, Yotsuo: *See*—
Yokogi, Masanobu; Sugimoto, Yoshifumi; and Ono, Yotsuo, 4,535,028, Cl. 428-398.000.

Onofusa, Norio: *See*—
Hiyoshi, Kazuhiko; Matsuura, Norio; Matsuguchi, Michiharu; Onofusa, Norio; and Nishikage, Tadao, 4,535,120, Cl. 524-560.000.

Oomori, Shogo: *See*—
Murakami, Nobuaki; and Oomori, Shogo, 4,534,334, Cl. 123-571.000.

Ootsuka, Kenichi; and Miyake, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Mobile electrical apparatus. 4,535,253, Cl. 307-9.000.

Oozeki, Hikaru: *See*—
Yamano, Yuzo; and Oozeki, Hikaru, 4,534,215, Cl. 73-862.440.

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Wilger, John F.; Nakano, Gregory S.; Orillo, Stephen, Jr.; and Cazinha, John R., 4,534,135, Cl. 51-241.00S.

Ortiz, Jose A.: *See*—
Forne , Ernesto; Foguet, Rafael; Sacristan, Aurelio; and Ortiz, Jose A., 4,535,159, Cl. 544-148.000.

Osaka Seiki Kabushiki Kaisha: *See*—
Matsuda, Teruo; and Kawaguchi, Kizo, 4,534,133, Cl. 51-58.000.

Osburn, Frank G.; and Riedel, Kenneth E., to Hollister Incorporated. Sealant pad for external catheter and method of use thereof. 4,534,768, Cl. 604-350.000.

Osuga, Minoru; and Oyama, Yoshishige, to Hitachi, Ltd. Air/fuel ratio detector. 4,534,330, Cl. 123-440.000.

O'Sullivan, Denis P. Automatic bundle-tying tool. 4,534,817, Cl. 156-352.000.

Oswald, James H.: *See*—
Evani, Syamalarao; Oswald, James H.; Staples, Thomas L.; and Polak, Brent T., 4,535,098, Cl. 521-149.000.

Otoguro, Yasuo: *See*—
Zaizen, Takashi; Otoguro, Yasuo; Yamanaka, Mikio; and Yamane, Shozo, 4,535,034, Cl. 428-653.000.

Otsuka, Kazunori: *See*—
Inaike, Toshihiro; Yamamoto, Shuji; Ohe, Shunji; and Otsuka, Kazunori, 4,535,105, Cl. 524-104.000.

Ottestad, Nils T. Gas regulator valve. 4,534,380, Cl. 137-490.000.

Overs, Ronald R. Adapter for installation of marine instruments. 4,534,307, Cl. 114-343.000.

Owens-Corning Fiberglas Corporation: *See*—
Herschler, Max G., 4,534,779, Cl. 65-6.000.

Owens-Illinois, Inc.: *See*—
Jabarin, Saleh A., 4,535,025, Cl. 428-220.000.

Oyama, Kiyotaka; and Harada, Tuneo, to Toyo Soda Manufacturing Co., Ltd. Process for producing a halogen-containing ethylbenzene derivative. 4,534,909, Cl. 260-465.00G.

Oyama, Yoshishige: *See*—
Osuga, Minoru; and Oyama, Yoshishige, 4,534,330, Cl. 123-440.000.

Ozelli, Riza N.; Hoffmann, Hans-Josef; and Lippert, Hartmut. Flocking adhesive for flexible substrates. 4,535,121, Cl. 524-715.000.

Pacault, Adolphe: *See*—
Canet, Roland; Delhaes, Pierre; Dupart, Eliane; Pacault, Adolphe; Pascal, Claude; and Manceau, Jean-Pierre, 4,535,317, Cl. 338-36.000.

Pacific Display Corporation: *See*—
Post, William L., 4,534,473, Cl. 211-58.000.

Package Machinery Co.: *See*—
Mosher, Oren A.; and Douglas, Ellwood S., 4,534,428, Cl. 177-1.000.
Page, John E.: *See*—
de Lorenzo, Mark X.; Hoffpauir, Charles R.; Hutchins, Johnnie R.; Meyer, Timmy R.; Page, John E.; and Poehl, Michael E., 4,535,134, Cl. 526-88.000.
Paget et Morel: *See*—
Morel, Michel, 4,534,628, Cl. 351-153.000.
Pai, Robert Y.: *See*—
Grossman, Mark W.; George, William A.; and Pai, Robert Y., 4,534,742, Cl. 445-9.000.
Pako Corporation: *See*—
Euteneuer, Charles L.; and Diesch, Robert E., 4,534,519, Cl. 242-68.300.
Palitex Project-Company GmbH: *See*—
Lorenz, Rainer, 4,534,160, Cl. 57-22.000.
Pall Corporation: *See*—
Pall, David B.; Degen, Peter J.; and Mischenko, John, III, 4,534,388, Cl. 141-1.000.
Pall, David B.; Degen, Peter J.; and Mischenko, John, III, to Pall Corporation. Dispersion system and method. 4,534,388, Cl. 141-1.000.
Palm, Richard R.; James, Robert G.; and Fisher, Robert E., to Armco Inc. Self-compensating oscillatory pump control. 4,534,706, Cl. 417-17.000.
Palvolgyi, Frank A., to United States of America, Air Force. Random timer. 4,535,466, Cl. 377-54.000.
Pangburn, William E. Nail file having flexible abrasive sheet. 4,534,138, Cl. 51-392.000.
Panipinto, David C.: *See*—
LaRosa, John; and Panipinto, David C., 4,534,201, Cl. 72-348.000.
Paolantonio, James R.: *See*—
Rhodes, Robert B.; and Paolantonio, James R., 4,535,453, Cl. 370-110.100.
Papa, Anthony J.; and Kaiser, Steven W., to Union Carbide Corporation. Preparation of isophorone and mesityl oxide from acetone. 4,535,187, Cl. 568-353.000.
Papadakis, Nicholas, to Diamond Shamrock Chemicals Company. Solid state transcutaneous blood gas sensors. 4,534,356, Cl. 128-635.000.
Papst-Motoren GmbH & Co., KG: *See*—
Muller, Rolf, 4,535,275, Cl. 318-254.000.
Schuh, Bernhard, 4,535,373, Cl. 360-97.000.
Paradyne Corp.: *See*—
Sandberg, Terrel W.; and Bottoms, Stanley, 4,535,452, Cl. 370-100.000.
Paragon Optical, Inc.: *See*—
Ratkowski, Donald J.; and Lue, Ping-Chang, 4,535,138, Cl. 526-279.000.
Parizet, Roger, to Compagnie Industrielle De Mecanismes en abrege C.I.M. Section-member for a slideway for correcting the orientation of a seat, its method of manufacture and the slideway comprising said section-member. 4,534,532, Cl. 248-371.000.
Park, Chung P.; and Suh, Kyung W., to Dow Chemical Company, The. Alkenyl aromatic monomer olefinically unsaturated acid foams and method for the preparation thereof. 4,535,094, Cl. 521-79.000.
Parker-Hannifin Corporation: *See*—
Burge, Donald G., 4,534,379, Cl. 137-385.000.
Parker, Harry A., to Transfer Print Foils, Inc. Gloss black metalized product and method of preparation. 4,535,024, Cl. 428-200.000.
Parker, James T., II: *See*—
Graham, Frank C.; and Parker, James T., II, 4,534,384, Cl. 137-899.200.
Parker, Michael S. Controlled rocking action furniture. 4,534,591, Cl. 297-270.000.
Parks, James D.; Moss, Charles A.; and Dyer, Kermit W., to Labconco Corporation. Laboratory fume hood. 4,534,281, Cl. 98-115.300.
Parliment, Thomas H.: *See*—
Zanno, Paul R.; and Parliment, Thomas H., 4,534,988, Cl. 426-535.000.
Parlman, Robert M.; and Bresson, Clarence R., to Phillips Petroleum Company. Ore flotation with combined collectors. 4,534,857, Cl. 209-166.000.
Partlow, Deborah P.: *See*—
Yoldas, Bulent E.; and Partlow, Deborah P., 4,535,026, Cl. 428-310.500.
Pas, Ireneus J. T. M.: *See*—
Fierkens, Richardus H. J.; and Pas, Ireneus J. T. M., 4,534,921, Cl. 264-39.000.
Pascal, Claude: *See*—
Canet, Roland; Delhaes, Pierre; Dupart, Eliane; Pacault, Adolphe; Pascal, Claude; and Manceau, Jean-Pierre, 4,535,317, Cl. 338-36.000.
Pasco, Wayne D.: *See*—
Arendt, Ronald H.; and Pasco, Wayne D., 4,534,956, Cl. 423-598.000.
Pastor, Manuel G., to Zerpa Industries, Inc. Solvent recovery method. 4,534,830, Cl. 203-86.000.
Pauly, Hans: *See*—
Weber, Adolf; Strauss, Hans; and Pauly, Hans, 4,534,292, Cl. 102-241.000.
Paxa, Charles. Nose bandage. 4,534,342, Cl. 128-163.000.
Payet, George L.; and Ballard, Stephen C., to Springs Industries, Inc. Woven textile fabric having an ultrasonically cut and sealed edge and apparatus and process for producing same. 4,534,819, Cl. 156-515.000.
Pazar, Charles A. Apparatus for burning bales of trash. 4,534,302, Cl. 110-346.000.
Peacock, Bobbie D.; Mushovic, John N.; and Geyer, Roger D., to M. A. Industries, Inc. Method and apparatus for supporting cylindrical concrete samples for testing. 4,534,225, Cl. 73-860.000.
Peacock, Kenneth L., to Standard Oil Company. Method and apparatus for digital time-variant filtering. 4,535,417, Cl. 364-724.000.
Pearlman, Bruce A., to Upjohn Company, The. Intermediates for the production of prostaglandins from D-glucose. 4,535,173, Cl. 549-433.000.
Peerman, Dwight E.; and Rogier, Edgar R., to Henkel Corporation. Alkoxylated polyester polyols. 4,534,907, Cl. 260-410.600.
Pees, James M.: *See*—
Fannin, Wayne V.; and Pees, James M., 4,534,545, Cl. 267-64.240.
Peeters, Hermann; Vogt, Wilhelm; and Theis, Christoph, to Dynamit Nobel Aktiengesellschaft. Method of preparing acetals and enol ethers from acyloxymethylene compounds. 4,534,910, Cl. 260-465.600.
Pellet, Regis J.: *See*—
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., 4,534,853, Cl. 208-120.000.
Pelletier, Jacques: *See*—
Arnal, Yves; Pelletier, Jacques; and Pomot, Claude, 4,534,842, Cl. 204-192.00E.
Pengilly, Brian W., to Goodyear Tire & Rubber Company, The. High clarity, low haze polyesters having reduced infrared heat-up times. 4,535,118, Cl. 524-398.000.
Penn, Thomas C., to Texas Instruments Incorporated. Apparatus and method for providing power from master controller to subcontrollers and data communication therebetween. 4,535,401, Cl. 364-132.000.
Pennella, Andrew J.: *See*—
Jahnke, William R.; Rockel, Bruce H.; Brown, Barry J.; Hawley, Floyd E.; Pennella, Andrew J.; Sugrue, John C.; and Wiggins, William R., 4,534,093, Cl. 29-26.00A.
Penney, Bruce J., to Tektronix, Inc. Method and circuit for measuring nonlinearity in dual-flash analog-to-digital converter. 4,535,319, Cl. 340-347.0AD.
Penney, Bruce J., to Tektronix, Inc. Video signal processing circuit and method for blanking signal insertion with transient distortion suppression. 4,535,357, Cl. 358-150.000.
Pennwalt Corporation: *See*—
Smith, Gary T., 4,534,156, Cl. 53-503.000.
Pentek Corporation: *See*—
Hoover, Alan A.; and Harris, Richard D., 4,534,462, Cl. 198-781.000.
Perbet, Jean-Noel: *See*—
Hareng, Michel; Perbet, Jean-Noel; and Graciet, Michel, 4,535,327, Cl. 340-719.000.
Perego, Ambrogio: *See*—
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Perepletchikov, Evgeny F.: *See*—
Bragin, Boris F.; Kolomiets, Alexandr S.; Korotkikh, Jury B.; Markuntovich, Felix D.; Olofinsky, Evgeny P.; Gladky, Petr V.; Perepletchikov, Evgeny F.; and Ekber, Boris Y., 4,534,540, Cl. 251-203.000.
Perkins, Jeffrey T.: *See*—
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Perlegos, George: *See*—
Smarandoiu, George; and Perlegos, George, 4,535,259, Cl. 307-530.000.
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van Eyken, Lawrence A. J.; and Perlin, Semion, 4,534,527, Cl. 246-445.000.
Perrey, Hermann; and Matner, Martin, to Bayer Aktiengesellschaft. Heat sensitizing agents, the production and use thereof. 4,535,111, Cl. 524-199.000.
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Preuss, Reinhard; Perrey, Hermann; Ritter, Helmut; Reinecke, Paul; and Brandes, Wilhelm, 4,535,074, Cl. 514-93.000.
Peschmann, Kristian R., to Imatron Associates. X-ray detector for high speed X-ray scanning system. 4,535,243, Cl. 250-363.00S.
Peter, Karl, to ROMEX Aktiengesellschaft. Inclined elevator with single rail. 4,534,451, Cl. 187-12.000.
Peters, Mark W.: *See*—
King, L. Tony; and Peters, Mark W., 4,534,655, Cl. 366-137.000.
Peterson, Donald W., to AT&T Bell Laboratories. Correction and monitoring of transient errors in a memory system. 4,535,455, Cl. 371-13.000.
Peterson, Steven G. Vertical mounting device for electrical circuit board components. 4,534,604, Cl. 339-17.00D.
Petit, Roland, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Device for measuring the flow of a fluid. 4,534,227, Cl. 73-861.870.
Petrie, Adelore F., to Motorola, Inc. Digital circuitry for producing indicative signals at predetermined times prior to periodic pulses. 4,535,464, Cl. 377-39.000.
Pettovello, Elzi: *See*—
Cox, Ron; and Pettovello, Elzi, 4,534,499, Cl. 226-184.000.
Pfarrwaller, Erwin, to Sulzer Brothers Limited. Tensioning beam assembly for a weaving machine. 4,534,386, Cl. 139-114.000.
Pfeifer, Jerome L.: *See*—
Wertheimer, Harry P.; Libsch, Thomas A.; Pfeifer, Jerome L.; and Becker, Paul C., 4,535,316, Cl. 338-34.000.

Pfeifer, Robert F.: *See—*
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Pfizer Inc.: *See—*
Kadin, Saul B., 4,535,081, Cl. 514-258.000.
Lombardino, Joseph G.; and Harbert, Charles A., 4,535,084, Cl. 514-277.000.

Phaal, Cornelius; Pipkin, Noel J.; and Burnand, Richard P. Abrasive product and method for manufacturing. 4,534,773, Cl. 51-293.000.

Pharmacia AB: *See—*
Axen, Rolf E.; Kaj, Goran L.; and Rigner, Bror S., 4,535,010, Cl. 427-246.000.

Pharmuka Laboratoires: *See—*
Audiau, Francois; Gueremy, Claude G. A.; and Le Fur, Gerard R., 4,535,080, Cl. 514-255.000.

Philip, Alexander S.: *See—*
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Philip Morris Incorporated: *See—*
Newsome, Reginald W., 4,534,367, Cl. 131-75.000.

Philips Petroleum Company: *See—*
Mark, Harold W.; Bertus, Brent J.; Roberts, John S.; McKay, Dwight L.; and Fenska, Lyle E., 4,535,066, Cl. 502-62.000.

Phillippi, R. Michael; and Drzewiecki, Thadeusz M., to United States of America, Army. Fluidic set point pressure sensor. 4,534,383, Cl. 137-840.000.

Phillips, Dorothy J., to Dow Chemical Company, The. Method for improving lactation in ruminant animals. 4,534,969, Cl. 424-118.000.

Phillips Petroleum Company: *See—*
Johnson, Timothy W.; and Banasiak, Dennis S., 4,535,116, Cl. 524-385.000.
Mathis, Ronald D.; and Reed, Jerry O., 4,535,117, Cl. 524-397.000.
McDaniel, Max P.; Johnson, Marvin M.; Hawley, Gil R.; Westerman, John; and Smith, Paul D., 4,535,070, Cl. 502-208.000.
Parlman, Robert M.; and Bresson, Clarence R., 4,534,857, Cl. 209-166.000.

Phillips Plastics Corporation: *See—*
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Phillips, Robert F.: *See—*
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Pickard, Jurgen: *See—*
Eltze, Georg; Luttge, Klaus; Pickard, Jurgen; Rubmann, Hans; and Sandner, Helmut, 4,534,457, Cl. 192-70.200.

Picker International Limited: *See—*
Holland, Geoffrey N., 4,535,403, Cl. 364-200.000.
Young, Ian R., 4,534,358, Cl. 128-653.000.

Piesch, Steffen: *See—*
Dorries, Peter; Gotze, Thomas; Piesch, Steffen; Schon, Manfred; Wulff, Gunther; Hintermeier, Karl; Wulff, Gunther; and Hintermeier, Karl, 4,535,031, Cl. 428-481.000.

Pioneer Electronic Corporation: *See—*
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Yamaguchi, Tadahiro; and Naito, Ryuichi, 4,535,306, Cl. 331-23.000.

Pipkin, Noel J.: *See—*
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Piquin, Jean-Claude, to Defontaine S.A. Drainage unit for aircraft sanitation systems. 4,534,082, Cl. 15-315.000.

Pirkau, Arno F.: *See—*
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Pitney Bowes Inc.: *See—*
Dlugos, Daniel F.; and Daniels, Edward P., 4,535,419, Cl. 364-900.000.
Duwel, Edward C.; and Soderberg, John H., 4,535,421, Cl. 364-900.000.
Eckert, Alton B.; Soderberg, John H.; and Duwel, Edward C., 4,535,407, Cl. 364-464.000.

Piurek, Walter J., to Atlantic Richfield Company. Automatic solder machine. 4,534,502, Cl. 228-102.000.

Plantronics, Inc.: *See—*
Silverglate, David E., 4,534,614, Cl. 350-1.400.

Plesko, George A., to Mars Incorporated. Low power coin routing gate apparatus. 4,534,459, Cl. 194-1.00D.

Plessey Company plc, The: *See—*
Maddern, Thomas S.; Ansell, John W.; and Philip, Alexander S., 4,535,442, Cl. 370-13.000.

Plibrico Limited: *See—*
Greener, Brian H., 4,535,001, Cl. 427-180.000.

Plueddemann, Edwin P.: *See—*
Kosal, Jeffrey A.; and Plueddemann, Edwin P., 4,534,880, Cl. 252-174.130.

Pneumo Corporation: *See—*
Vanderlaan, Robert D., 4,534,273, Cl. 91-510.000.

Pocock, John F. E.; Cole, Charles A.; Villanueva, James G.; Matlack, John D.; and Lewis, Shelton E., to Standard Oil Company (Indiana). Method for coating containers. 4,534,995, Cl. 427-38.000.

Poehl, Michael E.: *See—*
de Lorenzo, Mark X.; Hoffpauir, Charles R.; Hutchins, Johnnie R.; Meyer, Timmy R.; Page, John E.; and Poehl, Michael E., 4,535,134, Cl. 526-88.000.

Pohl, Walter J.: *See—*
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Polak, Brent T.: *See—*
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Polanschutz, Wolfgang: *See—*
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Polaroid Corporation: *See—*
Fielding, Herbert L.; and Ingwall, Richard T., 4,535,041, Cl. 430-1.000.
Simon, Myron S.; and Waller, David P., 4,535,051, Cl. 430-222.000.

Polat, Alain V.: *See—*
Franz, Michel R.; Vincze, Andreas B.; Lambelin, Georges E.; and Polat, Alain V., 4,534,911, Cl. 514-575.000.

Poldervaart, Leendert, to Single Buoy Moorings, Inc. System for maintaining a buoyant body in position in relation to another body. 4,534,740, Cl. 441-3.000.

Poloncic, Stanley J.: *See—*
Chen, Lee; Hendricks, Charles J.; Mathad, Gangadhara S.; and Poloncic, Stanley J., 4,534,816, Cl. 156-345.000.

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Sawazaki, Masatoshi; and Yorisue, Shozo, 4,534,187, Cl. 66-120.000.

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Pringle, Ronald E., to Camco, Incorporated. Hydraulic control fluid communication nipple. 4,534,414, Cl. 166-317.000.

Pritchard, Robert J.; and Lindenmuth, Kevin, to Teleflex Incorporated. Magnetic linear motor. 4,535,260, Cl. 310-12.000.

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Iding, Stephen H.; and Callicott, Robert H., 4,534,879, Cl. 252-174.000.
Russell, Glen D.; and Steuri, Christian, 4,534,877, Cl. 252-106.000.

Progressive Dynamics, Inc.: *See—*
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Puckette, Charles M., to General Electric Company. Binary signal demodulator with comparative value decision circuitry. 4,535,297, Cl. 329-126.000.

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Pullen, Alan J., to Discovision Associates. Universal video data playback. 4,535,366, Cl. 358-342.000.

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Yates, Donald B., 4,534,453, Cl. 188-52.000.

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Kraus, Robert G.; and Quick, James R., 4,534,886, Cl. 252-502.000.

Quick, Nathaniel R. Apparatus and method for processing wire strand cable for use in prestressed concrete structures. 4,534,310, Cl. 118-620.000.

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White, Jackie L., 4,534,371, Cl. 131-359.000.
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Rabinovich, Lev M.; Jurovsky, Albert Y.; Brodkin, Jury M.; Puginsky, Viktor A.; Iordan, Georgy G.; Serdjukov, Vilen I.; Sukhodolets, Vadim K.; Tikhnova, Galina V.; and Golikova, Galina M., to Gosudarstvenny Nauchno-Issledovatelsky Institut Teploenergeticheskogo Priborostroenia. Device for conversion of non-electrical quantity into electrical signal. 4,535,283, Cl. 323-365.000.

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Rader, Robert R.: *See*—
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,534,404, Cl. 164-429.000.

Raftis, Spiros G., to Red Valve Company, Inc. Isolation fluid pressure detector. 4,534,224, Cl. 73-730.000.

Rahe, Thomas E., to Motter Printing Press Co. Sheet diverting system. 4,534,552, Cl. 271-279.000.

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Ramsey, Mark S., to Exxon Production Research Co. Retrievable telemetry system. 4,534,424, Cl. 175-40.000.

Ranner, Max: *See*—
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Rapata, George M. Blind securement of cover plates and the like. 4,534,487, Cl. 220-305.000.

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Rathbun, Daniel L. Tamperproof capsule. 4,534,467, Cl. 206-530.000.

Rathge, Robert D.: *See*—
Schlie, LaVerne A.; and Rathge, Robert D., 4,535,457, Cl. 372-58.000.

Ratkowski, Donald J.; and Lue, Ping-Chang, to Paragon Optical, Inc. Silane ester contact lens composition, article and method of manufacture. 4,535,138, Cl. 526-279.000.

Ratzel, Dieter: *See*—
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Krause, Robert F.; Rauch, Gary C.; and Kasner, William H., 4,535,218, Cl. 219-121.0LH.

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Schoenberg, Jules E.; Flanagan, Thomas P.; and Ray-Chaudhuri, Dilip K., 4,535,140, Cl. 526-329.000.

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Burbank, Charles H.; and Lewis, Robert J., 4,534,433, Cl. 180-19.100.

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Jacobson, Bernard; and Raymond, Laurie, 4,534,967, Cl. 424-95.000.

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Lecolier, Serge L. M. B.; and Raynal, Serge F., 4,535,135, Cl. 526-174.000.

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Sullivan, William B., Jr., 4,535,286, Cl. 324-79.00R.
Ward, Charles S.; Laton, Richard W.; and Spada, John A., 4,535,302, Cl. 330-287.000.

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Frantz, Keith R.; Barnes, Robert A.; and Marks, Bruce G., 4,535,270, Cl. 315-8.000.
Gale, Michael T.; and Lehmann, Hans W., 4,534,620, Cl. 350-166.000.
Prusak, John J., 4,534,844, Cl. 204-281.000.
Reusch, Raymond K., 4,534,105, Cl. 29-589.000.
Westerman, Harry H., Jr., 4,535,223, Cl. 219-354.000.
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Rear, Ian G. Fluid operated hammer. 4,534,422, Cl. 173-134.000.

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Ferrell, Robert A.; and Rebber, Richard G., 4,534,752, Cl. 493-213.000.

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Smith, Russell D., 4,534,132, Cl. 49-386.000.

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Reece Corporation, The: *See*—
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Reed, Jerry O.: *See*—
Mathis, Ronald D.; and Reed, Jerry O., 4,535,117, Cl. 524-397.000.

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Reeds, John W., to Hughes Aircraft Company. Benchmark detector. 4,535,249, Cl. 250-491.100.

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Johnson, Frank; Reese, Dieter; and Hirbour, Louis, 4,534,843, Cl. 204-202.000.

Reeves, Timothy J. Apparatus and method for measuring the viscosity of a liquid. 4,534,210, Cl. 73-59.000.

Regalbuto, John A., to Jet Research Center, Inc. Perforating gun carrier and method of making. 4,534,423, Cl. 175-4.600.

Reichel, Curtis J., to BASF Wyandotte Corporation. Process for the preparation of polyether-ester polyols. 4,535,178, Cl. 560-91.000.

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Reinlein, Karl-Heinz; and Stablein, Bruno, to Fulguvit GmbH & Co. K.G. Apparatus for electrostatic spray-enameling. 4,534,311, Cl. 118-630.000.

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Woyton, Joseph T.; and Grant, George G., 4,534,114, Cl. 33-181.00R.

Rembaum, Alan; and Yen, Richard C. K., to California Institute of Technology. Hybrid microspheres. 4,534,996, Cl. 427-44.000.

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Taylor, Leonard S., 4,534,347, Cl. 128-303.100.

Reusch, Raymond K., to RCA Corporation. Method for grounding a pellet support pad in an integrated circuit device. 4,534,105, Cl. 29-589.000.

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Cosenza, Frank J., 4,534,234, Cl. 74-89.150.
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Rhodes, Robert B.; and Paolantonio, James R., to Siemens Corporate Research & Support, Inc. Signaling input/output processing module for a telecommunication system. 4,535,453, Cl. 370-110.100.

Rhodes, Stephen M.: *See*—
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Rice, Frederick H. Solar heat collector and reflector. 4,534,335, Cl. 126-429.000.

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Ricke, James. Hole plug. 4,534,088, Cl. 24-295.000.

Rickert, Glenn E. Projected stereoscopic picture separation. 4,535,354, Cl. 358-88.000.

Ricoh Company, Ltd.: *See*—
Horike, Masanori; Furukawa, Tatsuya; Ebi, Yutaka; and Yamazaki, Hiroshi, 4,535,339, Cl. 346-75.000.
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Axen, Rolf E.; Kaj, Goran L.; and Rigner, Bror S., 4,535,010, Cl. 427-246.000.

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Moore, George G. I., 4,535,165, Cl. 548-204.000.

Rinkewich, Isaac. Area pattern controlled sprinkler. 4,534,510, Cl. 239-97.000.

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Bauer, Kurt; Fischer, Karl-Heinz; and Huber, Heinz, 4,535,456, Cl. 371-16.000.
Berger, Klaus; Affeldt, Karl-Heinz; and Bottcher, Lutz, 4,534,361, Cl. 128-680.000.
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Jahnke, William R.; Rockel, Bruce H.; Brown, Barry J.; Hawley, Floyd E.; Pennella, Andrew J.; Sugrue, John C.; and Wiggins, William R., 4,534,093, Cl. 29-26.00A.

Rockwell International Corporation: *See*—
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Hogge, Charles R., Jr., 4,535,459, Cl. 375-80.000.
Moen, Walter K., 4,535,222, Cl. 219-300.000.
Morey, William A., 4,535,328, Cl. 340-739.000.
Walter, Robert J.; and Gerik, Bernard J., 4,534,794, Cl. 106-14.050.

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Rosan, Jose Jr., to Rexnord Inc. Method of installing self-locking nut and bolt assembly. 4,534,101, Cl. 29-432.000.

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Rose, Gene D., to Dow Chemical Company, The. Method for heat exchange fluids comprising viscoelastic surfactant compositions. 4,534,875, Cl. 252-71.000.

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Rossmann, William F. Tight-grip wrench. 4,534,245, Cl. 81-90.100.

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Gervais, William J., 4,535,370, Cl. 360-60.000.

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Rousseau, Michel. Paint can holder. 4,534,528, Cl. 248-210.000.

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Eltze, Georg; Luttge, Klaus; Pickard, Jurgen; Rubmann, Hans; and Sandner, Helmut, 4,534,457, Cl. 192-70.200.

Russell, Anthony W.; and Russell, Michael K., to NL Sperry-Sun, Inc. Apparatus for signalling within a borehole while drilling. 4,535,429, Cl. 367-85.000.

Russell, Glen D.; and Steuri, Christian, to Procter & Gamble Company, The. Shampoo compositions comprising specific betaine surfactants and a quaternary compound. 4,534,877, Cl. 252-106.000.

Russell, Michael K.: *See*—
Russell, Anthony W.; and Russell, Michael K., 4,535,429, Cl. 367-85.000.

Russell, Rupert A. V.: *See*—
Evans, Brian E.; Hemm, Stephen R.; and Russell, Rupert A. V., 4,535,285, Cl. 324-71.100.

Russo, Louis: *See*—
Luo, Tatao; Russo, Louis; and Freenor, Francis J., III, 4,534,786, Cl. 71-88.000.

Russo, Ronald D., to Superior Plastic Products Corp. Suction control device for aspirator system. 4,534,542, Cl. 251-342.000.

Russomanno, Charles, to Block Drug Company, Inc. Automatic dispenser for disinfectant and bowl cleaning fluid. 4,534,071, Cl. 4-228.000.

Russomanno, Charles G.: *See*—
Hauptmann, Michael C.; and Russomanno, Charles G., 4,534,070, Cl. 4-228.000.

Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , to Magyar Tudomanyos Akademia Kozponti Hivatala; and Lenin Mezogazdasagi Termeloszovetkezet. Method for increasing the biological value of manures, dung-waters, organic wastes and/or soils rich in lysine. 4,534,782, Cl. 71-21.000.

Rutgerswerke Aktiengesellschaft: *See*—
Glaser, Herbert; and Stolzenberg, Konrad, 4,534,949, Cl. 423-445.000.

Ruti-te Strake B.V.: *See*—
van Hest, Cornelius A. J. H., 4,534,387, Cl. 139-435.000.

Rutten, Peter T.; and Kalinowski, James E., to Blue Harbor, Inc. Sea anchor. 4,534,306, Cl. 114-311.000.

Rybicki, George C.: *See*—
Smialek, James L.; and Rybicki, George C., 4,535,035, Cl. 428-698.000.

Rydborn, Sten A. Apparatus for controlling a number of boilers. 4,534,321, Cl. 122-448.00B.

Ryuo, Toshihiko: *See*—
Sakaguchi, Susumu; Itoh, Ken; Ogihara, Masahiro; Makigawa, Shinji; Ryuo, Toshihiko; and Watanabe, Kazuyoshi, 4,534,821, Cl. 156-617.0SP.

Sabin, Cullen M.: *See*—
Poppendiek, Heinz F.; and Sabin, Cullen M., 4,534,663, Cl. 374-43.000.

Sabota, James J.; and Bradshaw, William G. Method and apparatus for cleaning printing presses. 4,534,291, Cl. 101-426.000.

Sabourin, Edward T.: *See*—
Bakshi, Kiran R.; Barie, Walter P.; and Sabourin, Edward T., 4,535,115, Cl. 524-376.000.

Sach, George S., to Smith Kline & French Laboratories Limited. 2-Aminoalkyl-pyridine derivatives. 4,535,163, Cl. 546-300.000.

Sackett, Michael J.: *See*—
Alt, Daniel M.; and Sackett, Michael J., 4,534,654, Cl. 366-137.000.

Sacristan, Aurelio: *See*—
Forne , Ernesto; Foguet, Rafael; Sacristan, Aurelio; and Ortiz, Jose A., 4,535,159, Cl. 544-148.000.

SAES Getters S.p.A.: *See*—
Martelli, Daniele; and Lani, Giuseppe, 4,535,267, Cl. 313-481.000.

Saito, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Excavating and propelling machine for laying pipelines underground. 4,534,676, Cl. 405-184.000.

Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, to Nihon Tokushu Noyaku Seizo K.K. Organophosphate pesticides. 4,535,076, Cl. 514-128.000.

Saito, Takashi: *See*—
Kishi, Toru; and Saito, Takashi, 4,535,433, Cl. 369-77.200.

Saito, Toranosuke: *See*—
Arai, Naoto; Murakami, Takeshi; Suzuki, Toshitake; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,535,190, Cl. 568-721.000.

Sakaguchi, Susumu; Itoh, Ken; Ogihara, Masahiro; Makigawa, Shinji; Ryuo, Toshihiko; and Watanabe, Kazuyoshi, to Shin-Etsu Chemical Co., Ltd. Single crystal growing of rare earth-gallium garnet. 4,534,821, Cl. 156-617.0SP.

Sakai, Hiroshi: *See*—
Takeuchi, Fumio; Takahashi, Masao; Hattori, Katsuhide; and Sakai, Hiroshi, 4,534,809, Cl. 149-3.000.

Sakai, Sai, to New Cosmos Electric Co., Ltd. Alkane gas sensor comprising tin oxide semiconductor with large surface area. 4,535,315, Cl. 338-34.000.

Sakaki, Yasuo: *See*—
Yagyu, Takashi; Yamaguchi, Takeshi; Tanaka, Sotaro; and Sakaki, Yasuo, 4,534,268, Cl. 91-6.000.

Sakakibara, Shiro: *See*—
Yokoyama, Shoji; and Sakakibara, Shiro, 4,534,243, Cl. 74-868.000.

Sakamoto, Masanori: *See*—
Harada, Nozomu; Oana, Yasuhisa; Ogi, Keisuke; Izawa, Koji; Taya, Akira; and Sakamoto, Masanori, 4,534,622, Cl. 350-334.000.

Sakamoto, Takashi, to Dainippon Screen Seizo Kabushiki Kaisha. Method and apparatus for positioning original pictures into a transparent sheet to be mounted to a picture cylinder of a picture reproducing machine. 4,535,365, Cl. 358-287.000.

Sakash, George; Grier, Robert K., Jr.; Stern, Hansjoerg; Dada, Abdul G.; and McKeel, Daniel W., to General Electric Company. Incinerator ash removal systems. 4,534,301, Cl. 110-255.000.

Sakata, Tomio, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for detecting the duration of voice. 4,535,473, Cl. 381-46.000.

Sakuma, Osamu: *See*—
Wakabayashi, Tetsushi; Honda, Norio; and Sakuma, Osamu, 4,535,384, Cl. 361-386.000.

Salamone, Joseph C.: *See*—
Ellis, Edward J.; and Salamone, Joseph C., 4,534,878, Cl. 252-173.000.

Salesse, Marc: *See*—
Meunier, Jean; and Salesse, Marc, 4,534,937, Cl. 419-42.000.

Saliger, Kenneth C., to Mobil Oil Corporation. Pipe joint locking device. 4,534,585, Cl. 285-92.000.

Salomon, Georges P. J.; and Vinay, Jean-Paul, to Salomon S.A. Cross-country or touring ski boot and method of manufacture. 4,534,123, Cl. 36-99.000.

Salomon S.A.: *See*—
Salomon, Georges P. J.; and Vinay, Jean-Paul, 4,534,123, Cl. 36-99.000.

Salvagnini, Guido, to Salvagnini Transferica S.p.A. Shearing machine for metal sheet having blades at right angles consisting of mutually movable segments. 4,534,255, Cl. 83-530.000.

Salvagnini Transferica S.p.A.: *See*—
Salvagnini, Guido, 4,534,255, Cl. 83-530.000.

Sambucetti, Carlos J.: *See*—
King, David E.; Markovich, Voya; Sambucetti, Carlos J.; Tisdale, Stephen L.; and Trevitt, Donna J., 4,534,797, Cl. 106-1.230.

Sanada, Yuzo; Yokoyama, Susumu; Chiba, Tadatoshi; Yokono, Tetsuro; Moritomi, Hiroshi; Obara, Toshiyuki; and Nagaishi, Hiroshi, to Hokkaido University. Coal liquefaction with a selenium catalyst. 4,534,848, Cl. 208-10.000.

Sandberg, Terrel W.; and Bottoms, Stanley, to Paradyne Corp. Multimodem variable port demultiplexer synchronization adapter. 4,535,452, Cl. 370-100.000.

Sandberg, Thomas A.: *See*—
Niles, Gerald J.; and Sandberg, Thomas A., 4,535,432, Cl. 369-72.000.

Sanders, Howard E. Atmospheric consistometer. 4,534,209, Cl. 73-59.000.

Sandner, Helmut: *See*—
Eltze, Georg; Luttge, Klaus; Pickard, Jurgen; Rubmann, Hans; and Sandner, Helmut, 4,534,457, Cl. 192-70.200.

Sani-Fresh International, Inc.: *See*—
Heck, Samuel C.; and Garrison, Lee E., 4,534,669, Cl. 401-134.000.

Sanko Kaihatsu Kagaku Kenkyusho: *See*—
Arai, Naoto; Murakami, Takeshi; Suzuki, Toshitake; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,535,190, Cl. 568-721.000.

Sano, Mikio: *See*—
Tarnoff, Sherwin S.; and Sano, Mikio, 4,534,264, Cl. 89-14.300.

Santostasi, Paul A.; Dutt, Herbert V.; and Pirkau, Arno F., to Sun Coast Plastics, Inc. Tamper evident closure. 4,534,480, Cl. 215-252.000.

Sanwa Seiki Mfg. Co., Ltd.: *See*—
Koyanagi, Yuzo, 4,535,402, Cl. 364-152.000.

Sarofeen, George M. J.; and Perkins, Jeffrey T. Method for pattern generation and surfacing of optical elements. 4,534,137, Cl. 51-284.00R.

Sasakawa, Masumi: *See*—
Inoue, Sukejiro; Sasakawa, Masumi; Fukumoto, Hiroshi; and Doi, Shinji, 4,535,048, Cl. 430-110.000.

Sasaki, Shosaku; and Kaiya, Nobuo, to Toray Silicone Company, Limited. Releasable film forming compositions. 4,535,123, Cl. 524-862.000.

Sasaki, Yoshio: *See*—
Hashimoto, Masahide; Kurisu, Yoshitaka; Zuiki, Shigeo; and Sasaki, Yoshio, 4,534,183, Cl. 62-374.000.

Sashital, Sanat K., to Hughes Aircraft Company. Method of synthesizing thin, single crystal layers of silver thiogallate ($AgGaS_2$). 4,534,822, Cl. 156-624.000.

Sato, Akihiro: *See*—
Shimizu, Hiroshi; Abe, Masaki; and Sato, Akihiro, 4,535,069, Cl. 502-115.000.

Sato, Hideo: *See*—
Kawamura, Kouichi; Horie, Seiji; and Sato, Hideo, 4,535,045, Cl. 430-60.000.

Sato, Koji: *See*—
Kodama, Toshikazu; and Sato, Koji, 4,535,265, Cl. 310-313.00C.

Sato, Shigeru: *See*—
Shindo, Masanari; Sato, Shigeru; and Kaneko, Akinari, 4,534,840, Cl. 204-192.00R.

Sato, Toshiji: *See*—
Taguchi, Gyota; and Sato, Toshiji, 4,534,992, Cl. 426-656.000.

Sato, Yoichi: *See*—
Nishikawa, Masao; Aoki, Takashi; Sato, Yoichi; and Yoshizawa, Hiroshi, 4,534,236, Cl. 74-364.000.

Satoh, Isao; Yoshida, Tomio; Ohara, Shunji; and Koishi, Kenji, to Matsushita Electric Industrial Co., Ltd. Optical having index mark and sector mark. 4,535,439, Cl. 369-275.000.

Saunier, Christian: *See*—
Allard, Jean-Claude; Briard, Rene; and Saunier, Christian, 4,534,735, Cl. 434-20.000.

Savage, David W.: *See*—
Weinberg, Harold N.; Savage, David W.; and Weissman, Walter, 4,534,854, Cl. 208-131.000.

Savaria, Pierre. Invalid lift. 4,534,450, Cl. 187-9.00R.

Sawa, Yuji; Itoh, Toshio; and Adachi, Kuniomi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Solid material packing method and machine. 4,534,155, Cl. 53-459.000.

Sawada, Kazuyoshi, to Silver Seiko Ltd. Printing mechanism having a plurality of type plates. 4,534,664, Cl. 400-110.000.

Sawazaki, Masatoshi; and Yorisue, Shozo, to Precision Fukuhara Works, Ltd. Sliding latch needles. 4,534,187, Cl. 66-120.000.

Sawazaki, Norikazu, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic recording and reproducing apparatus. 4,535,369, Cl. 360-55.000.

Sawicki, Nina P. Tamper indicating cover. 4,534,478, Cl. 215-230.000.

Saxby, Robert M. Cigarette extinguisher and ash disposal device. 4,534,370, Cl. 131-237.000.

Say, Donald L., to North American Philips Consumer Electronics Corp. In-line electron gun structure for color cathode ray tube having tapered walls and elongated apertures for beam spot-shaping. 4,535,266, Cl. 313-414.000.

Scerbo, Joseph E.; and Johnson, Roy B., to York Industries, Inc. Locking, bearing and actuating apparatus. 4,534,269, Cl. 91-41.000.

Schade, John E.; and King, A. Douglas, Jr., to United States of America, Agriculture. Method for detecting aflatoxin in almonds. 4,535,248, Cl. 250-459.100.

Schaefer, Roland, to Kulzer & Co. GmbH. Process for the photopolymerization of vinyl compounds and photopolymerizable materials. 4,534,839, Cl. 204-159.230.

Schaumburg, Edward G.; Benson, Cory D.; Wolf, Alby H.; and Zais, Michael G., to GNB Batteries Inc. Apparatus and method for casting straps on battery cell elements. 4,534,401, Cl. 164-102.000.

Scheffer, Hans: *See*—
Damman, Ben; Scheffer, Hans; de Witte, Paul; Krause, Johannes; Haas, Hans; and Kowalski, Werner, 4,534,946, Cl. 423-315.000.

Schenk, Raymond L.: *See*—
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,534,404, Cl. 164-429.000.

Scherer, Michael: *See*—
Hartig, Klaus; Dietrich, Anton; and Scherer, Michael, 4,534,841, Cl. 204-192.00P.

Schieber, Franz: *See*—
Zollner, Dieter H.; Zollner, Christine; Schieber, Franz; Lauterbach-Dammler, Inge; and Koziol, Konrad, 4,534,836, Cl. 204-67.000.

Schindler, Peter: *See*—
Blumbach, Jurgen; and Schindler, Peter, 4,535,156, Cl. 544-26.000.

Schlaechter, John, to Guild Associates, Inc. Pressure swing cycle for the separation of oxygen from air. 4,534,346, Cl. 128-205.120.

Schleicher & Schuell, Inc.: *See*—
Bacon, David L.; Kremer, Richard D.; and Morse, Randall H., 4,534,863, Cl. 210-232.000.

Schlembach, Hans: *See*—
Latsch, Reinhard; and Schlembach, Hans, 4,534,327, Cl. 123-263.000.

Schlie, LaVerne A.; and Rathge, Robert D., to United States of America, Air Force. Transverse flow CW atomic iodine laser system. 4,535,457, Cl. 372-58.000.

Schlumberger Technology Corporation: *See*—
Sinha, Bikash K.; and Gouilloud, Michel, 4,534,223, Cl. 73-703.000.

Schmidt, Jimmy Q., to United States of America, Army. Automatic velocity controlled delay circuit. 4,535,462, Cl. 377-2.000.

Schmidt-Kufeke, Klaus-Peter: *See*—
Feld, Gerhard; and Schmidt-Kufeke, Klaus-Peter, 4,534,994, Cl. 427-37.000.

Schmidt, Paul J.; and Hung, William M., to Hilton-Davis Chemical Co., The. 3(Ether and thioether) 3'-(4-dialkylaminophenyl) phthalides. 4,535,172, Cl. 549-310.000.

Schmolka, Irving R., to BASF Wyandotte Corporation. Aerosol gel. 4,534,959, Cl. 424-45.000.

Schneck, Hans; and Tiitinen, Esko, to A. Ahlstrom Osakeyhtio. Method and apparatus for packaging paper rolls. 4,534,151, Cl. 53-415.000.

Schneider, Martin V.: *See*—
Cho, Alfred Y.; Glance, Bernard; Lubzens, Daniel; and Schneider, Martin V., 4,534,103, Cl. 29-571.000.

Schneider, Michael; Kochloefl, Karel; and Ladebeck, Jurgen, to Sud Chemie Aktiengesellschaft. Catalyst for methanol synthesis and method of preparing the catalyst. 4,535,071, Cl. 502-342.000.

Schneider, Wilfried, to Siemens Aktiengesellschaft. Installation for cooling a fuel element storage well with several water circuits. 4,534,931, Cl. 376-272.000.

Schnell, Joachim. Spring-action running and jumping shoe. 4,534,124, Cl. 36-114.000.

Schnell, Wolfgang: *See*—
Hildel, Heinz; Schnell, Wolfgang; and Westphal, Gerald, 4,534,668, Cl. 400-477.000.

Schnitzler, Alois, to Christian Miesen Fahrzeug-Und Karosseriewerk GmbH. Stretcher having backrest and safety harness. 4,534,075, Cl. 5-82.00R.

Schoenberg, Jules E.; Flanagan, Thomas P.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Hot-melt adhesives based on vinyl polymer. 4,535,140, Cl. 526-329.000.

Scholbrock, Steven D.: *See*—
Lane, Michael S.; and Scholbrock, Steven D., 4,535,445, Cl. 370-62.000.

Schon, Manfred: *See*—
Dorries, Peter; Gotze, Thomas; Piesch, Steffen; Schon, Manfred; Wulff, Gunther; Hintermeier, Karl; Wulff, Gunther; and Hintermeier, Karl, 4,535,031, Cl. 428-481.000.

Schoofs, Franciscus A. C. M.; and Nijman, Aloysius J., to U.S. Philips Corporation. Driver circuit. 4,535,303, Cl. 330-297.000.

Schoonejongen, Ronald J.: *See*—
Martin, F. Wayne; Shahbazi, Samson; and Schoonejongen, Ronald J., 4,535,012, Cl. 427-386.000.

Schorr, Peter: *See*—
Kliesch, Wilfried; Koch, Friedrich-Otto; Wahl, Hans-Jurgen; Krebs, Rolf; Schorr, Peter; and Strauch, Heinz, deceased, 4,535,215, Cl. 219-61.500.

Schreiner, Donald G.: *See*—
Brown, Vincent B.; and Schreiner, Donald G., 4,534,098, Cl. 29-564.800.

Schreyer, Gerold: *See*—
Bung, Richard; Gans, Karl; Schreyer, Gerold; and Welzel, Gerhard, 4,534,720, Cl. 425-7.000.
Haas, Franz; Janisch, Gerhard; and Schreyer, Gerold, 4,535,004, Cl. 427-212.000.
Haas, Franz; Janisch, Gerhard; and Schreyer, Gerold, 4,535,005, Cl. 427-212.000.

Schroder, Peter; Kunkel, Fred; and Hummel, Peter, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Ink film dispensing system for a printing press. 4,534,290, Cl. 101-365.000.

Schubart, Rudiger; and Magg, Hans, to Bayer Aktiengesellschaft. Cobalt-boron compounds. 4,534,901, Cl. 556-7.000.

Schubring, Allin W.; and Sehmer, Robert W., to Square D Company. Pneumatic timing attachment for an electromagnetic device. 4,535,310, Cl. 335-61.000.

Schuerch, Peter E., to New England Ropes, Inc. Rope or cable and method of making same. 4,534,163, Cl. 57-233.000.

Schuh, Bernhard, to Papst-Motoren GmbH & Co. KG. Labyrinth seal in disk storage drive. 4,535,373, Cl. 360-97.000.

Schulz, Peter: *See*—
Klein, Jurgen; and Schulz, Peter, 4,535,065, Cl. 502-21.000.

Schulz, Volkmar: *See*—
Hess, Peter; Schulz, Volkmar; and Rampel, Hans, 4,534,534, Cl. 248-424.000.

Schumacher, Gebhard F. B. A.; and Usala, Stephen J., to University Patents, Inc. Method and apparatus for detection of fertility. 4,534,362, Cl. 128-738.000.

Schwaab Inc.: *See*—
Zahn, William L.; and Kufrin, Fred W., 4,534,471, Cl. 211-39.000.

Schwab, Frederick C., to Mobil Oil Corporation. High impact graft copolymers of methyl ethenyl benzene on rubber backbone. 4,535,129, Cl. 525-316.000.

Schwaertzel, Heinz; and Unterberger, Hans, to Siemens Aktiengesellschaft. Communication system for stationary and mobile subscribers. 4,535,441, Cl. 370-4.000.

Schwartz, Jack; and Wu, Tai T. Wow and flutter control apparatus for audio and video playback systems. 4,535,368, Cl. 360-28.000.

Schwarzli, Joseph W. Coin operated vending machine having a secure cashbox and an antitampering safety mechanism. 4,534,492, Cl. 221-203.000.

Scott, Fred J.; and Walker, Gary W., to Sperry Corporation. Shielded connector shell for flat cable. 4,534,608, Cl. 339-91.00R.

Scott, Mark P., to Keystone Industries, Inc. Lock and seal for hopper outlet. 4,534,298, Cl. 105-282.00R.

Scott Paper Company: *See*—
Norton, Henry J.; and Urion, Kenard E., 4,534,491, Cl. 221-63.000.

Scott, William T.: *See*—
Buckley, John J.; and Scott, William T., 4,534,538, Cl. 251-62.000.

Sears, Barry D., to Lipid Specialties, Inc. Synthetic phospholipid compounds. 4,534,899, Cl. 260-403.000.

Secton Pty. Ltd.: *See*—
Carroll, William F., 4,534,395, Cl. 160-199.000.

Sedran, Roger H., to National Starch and Chemical Corporation. Apparatus for dispensing high viscosity thermoplastic materials. 4,534,493, Cl. 222-146.200.

Seeq Technology, Inc.: *See*—
Smarandoiu, George; and Perlegos, George, 4,535,259, Cl. 307-530.000.

Segawa, Makoto: *See*—
Ariizumi, Shoji; Segawa, Makoto; and Masuoka, Fujio, 4,535,426, Cl. 365-182.000.

Sehmer, Robert W.: *See*—
Schubring, Allin W.; and Sehmer, Robert W., 4,535,310, Cl. 335-61.000.

Seibert, Darrel L. Portable water filtration system for oil well fractionation. 4,534,869, Cl. 210-788.000.

Seigneurin, Michel; and Blanc, Roger, to Micro-Mega. Device for dental massage to prevent tooth decay. 4,534,733, Cl. 433-122.000.

Seki, Masaki: *See*—
Kishi, Hajimu; Tanaka, Kunio; and Seki, Masaki, 4,535,408, Cl. 364-475.000.

Sekine, Kazumi: *See*—
Kano, Kuniomi; Fushimoto, Hideo; Sekine, Kazumi; Miyagawa, Akira; Hirata, Osamu; and Nishimuro, Yoshiaki, 4,535,416, Cl. 364-715.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
Honda, Seiichirou; Ogawara, Hiroshi; and Fukuda, Mutsumi, 4,534,798, Cl. 106-266.000.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See*—
Morioka, Kazumasa; and Yoshimi, Toru, 4,534,927, Cl. 264-321.000.
Sekizaki, Satoshi; Hosoya, Eiji; and Takasu, Hotoyuki, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for attaching transmission casing and brake casing in motorized three-wheeled vehicle. 4,534,440, Cl. 180-215.000.
Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Wet adhesion promoters for emulsion polymers. 4,535,122, Cl. 524-809.000.
Selestam, Rune K.; and Nygren, Ingemar K. Horizontal-shaft wind turbine with few blades. 4,534,705, Cl. 416-162.000.
Self, Michael A.: *See*—
Mullins, Lance A.; and Self, Michael A., 4,535,326, Cl. 340-679.000.
Seltzer, Raymond: *See*—
Steinberg, David H.; Seltzer, Raymond; Luzzi, John J.; and Cortolano, Frank P., 4,534,874, Cl. 252-51.50A.
Semple, J. Edward: *See*—
Gardner, Gary M.; and Semple, J. Edward, 4,534,787, Cl. 71-88.000.
Senmed, Inc.: *See*—
Rothfuss, Robert G.; Kuhl, David K.; Bilotti, Federico; Melling, Hugh; and Mills, Earl J., 4,534,351, Cl. 128-334.00R.
Seragnoli, Enzo, to G. D. Societa' per Azioni. Feeding and cutting device for a continuous web. 4,534,253, Cl. 83-336.000.
Serdjukov, Vilen I.: *See*—
Rabinovich, Lev M.; Jurovsky, Albert Y.; Brodkin, Jury M.; Puginsky, Viktor A.; Iordan, Georgy G.; Serdjukov, Vilen I.; Sukhodolets, Vadim K.; Tikhnova, Galina V.; and Golikova, Galina M., 4,535,283, Cl. 323-365.000.
Shackelford, G. Raymond, Sr. Automobile wheel lift for a tow truck. 4,534,579, Cl. 280-402.000.
Shah, Raj: *See*—
Sekmakas, Kazys; and Shah, Raj, 4,535,122, Cl. 524-809.000.
Shahbazi, Samson: *See*—
Martin, F. Wayne; Shahbazi, Samson; and Schoonejongen, Ronald J., 4,535,012, Cl. 427-386.000.
Shakespeare, Walter J.: *See*—
Mammel, Lewis H.; and Shakespeare, Walter J., 4,534,776, Cl. 55-136.000.
Shani, Gad, to Ben-Gurion University of the Negev Research & Development Authority. Fast neutron radiography system. 4,535,246, Cl. 250-390.000.
Shanoski, Henry: *See*—
Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, 4,534,888, Cl. 252-511.000.
Sharp Kabushiki Kaisha: *See*—
Koyanagi, Katubumi; Take, Hiroshi; and Uede, Hisashi, 4,535,329, Cl. 340-785.000.
Sharp, William J.: *See*—
Simashkevich, Richard M.; and Sharp, William J., 4,534,106, Cl. 29-613.000.
Shaver, Larry D. Antenna luggage rack. 4,535,336, Cl. 343-713.000.
Shedore, Charles; and Filipiak, Stanley E., to Illinois Tool Works Inc. Keyswitch stabilizing device. 4,535,210, Cl. 200-340.000.
Sheetz, Richard S.; and Cachat, John F., to Tocco, Inc. Apparatus and method of hardening valve seats. 4,535,212, Cl. 219-10.770.
Shell Internationale Research Maatschappij B.V.: *See*—
Ensing, Lukas, 4,535,292, Cl. 324-330.000.
Shell Oil Company: *See*—
Gardner, Gary M.; and Semple, J. Edward, 4,534,787, Cl. 71-88.000.
Job, Robert C., 4,535,068, Cl. 502-107.000.
McCullough, J. Douglas, Jr., 4,535,125, Cl. 525-88.000.
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Watabe, Shin; and Shibata, Hideto, 4,534,410, Cl. 165-126.000.
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Ogawa, Masaki; and Shiomura, Yasuro, 4,535,003, Cl. 427-207.100.
Shionogi & Co., Ltd.: *See*—
Makisumi, Yasuo; Murabayashi, Akira; Tawara, Katsuya; Watanabe, Yoshihachi; and Takahashi, Tcahio, 4,535,088, Cl. 514-370.000.
Shiota, Kazuo; and Akimoto, Taizo, to Fuji Photo Film Co., Ltd. Hue identifying apparatus. 4,535,413, Cl. 364-526.000.
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Wada, Hidekazu; Yoshino, Hironori; and Shiota, Kohei, 4,535,382, Cl. 361-319.000.
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Shirota, Kazunori, 4,534,150, Cl. 53-390.000.
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Constance-Hughes, Trevor, 4,534,344, Cl. 128-201.150.
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Kempter, Karl, 4,535,468, Cl. 378-31.000.
Lichti, Reiner, 4,535,346, Cl. 346-140.00R.
Magdefessel, Heinz, 4,534,708, Cl. 417-51.000.
Schneider, Wilfried, 4,534,931, Cl. 376-272.000.
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Wohlfart, Artur, 4,534,611, Cl. 339-217.00S.
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Rhodes, Robert B.; and Paolantonio, James R., 4,535,453, Cl. 370-110.100.
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Dirkse, Franciscus J.; and Kulberg, Gerardus H., deceased, 4,535,242, Cl. 250-363.00S.
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Borish, Jeffrey G.; and Ewy, M. Dale, 4,535,474, Cl. 381-61.000.
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Jenkins, James O. M.; and Gardner, Nigel C., 4,535,203, Cl. 179-81.00R.
Silver Seiko Ltd.: *See*—
Sawada, Kazuyoshi, 4,534,664, Cl. 400-110.000.
Silverglate, David E., to Plantronics, Inc. Aspherical lens for concentrating diffuse optical radiation. 4,534,614, Cl. 350-1.400.
Silverman, Michael A., to Tenneco Oil Company. Shale oil demetallization process. 4,534,855, Cl. 208-253.000.
Silverthorn, Charles R.; and Allhands, Marcus N., to A. O. Smith Harvestore Products, Inc. Conveyor construction for conveying materials to an elevated location. 4,534,461, Cl. 198-592.000
Simashkevich, Richard M.; and Sharp, William J., to Nordson Corporation. Method for replacing dielectric material at the high-value resistor of an electrostatic spray gun to prevent corona discharge. 4,534,106, Cl. 29-613.000.
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Simmons Universal Corporation: *See*—
Martin, Kelly D., 4,534,077, Cl. 5-424.000.
Simon, Myron S.; and Waller, David P., to Polaroid Corporation. Photographic products and processes with color shifted dye. 4,535,051, Cl. 430-222.000.
Simone, Dominic: *See*—
Brauer, Melvin; and Simone, Dominic, 4,535,142, Cl. 528-75.000.
Simpson, Harold G.; and Neyer, Leo E., to Encon Products, Inc. Adjustable roofing support spacer apparatus and erection method. 4,534,148, Cl. 52-640.000.

Sinclair & Rush, Inc.: *See*—
Ventimiglia, Joseph J.; and Diener, Lawrence R., 4,534,391, Cl. 150-52.00R.

Single Buoy Moorings, Inc.: *See*—
Poldervaart, Leendert, 4,534,740, Cl. 441-3.000.

Sinha, Bikash K.; and Gouilloud, Michel, to Schlumberger Technology Corporation. Surface acoustic wave sensors. 4,534,223, Cl. 73-703.000.

Siol, Werner; Rauch, Hubert; and Fleck, Guenter, to Rohm GmbH. Method for making a salt free solid polymer from a polymer emulsion. 4,535,137, Cl. 526-216.000.

Sirinyan, Kirkor; Merten, Rudolf; and Giesecke, Henning, to Bayer Aktiengesellschaft. Black-metallized substrate surfaces. 4,535,032, Cl. 428-629.000.

SKF GmbH: *See*—
Hans, Rudiger; Brandenstein, Manfred; Friedrich, Wolfgang; and Haas, Roland, 4,534,749, Cl. 474-174.000.

SKF Industries, Inc.: *See*—
Johnson, John H., 4,534,871, Cl. 252-12.000.

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Olschewski, Armin; and Bauer, Bernhard, 4,534,095, Cl. 29-148.40C.

Skobel, Max. Releasable clasp. 4,534,090, Cl. 24-625.000.

SKW Trostberg Aktiengesellschaft: *See*—
Elischer, Stefan; Hobel, Hans-Gunther; Merkt, Robert; and Wagner, Fritz, 4,535,160, Cl. 544-191.000.

Slattery, Gordon C., to Brunswick Corporation. Internal combustion engine with air-fuel mixture heating. 4,534,333, Cl. 123-545.000.

Slattery, Gordon C., to Brunswick Corp. Recoil starter lock and neutral gear throttle limit for marine drives. 4,534,739, Cl. 440-84.000.

Slezak, Paul J., to KHD Canada, Inc. Hydrodynamic power transmission unit. 4,534,456, Cl. 192-58.00A.

Sliwa, John W., Jr., to Xerox Corporation. Interfacial blister bonding for microinterconnections. 4,535,219, Cl. 219-121.0LC.

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Smith, Arnold R., to AT&T Bell Laboratories. Automatic locking device. 4,534,586, Cl. 292-228.000.

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Smith, Gary T., to Pennwalt Corporation. Box filling apparatus. 4,534,156, Cl. 53-503.000.

Smith, Gene. Toilet seat lifter. 4,534,073, Cl. 4-251.000.

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van Konynenburg, Peter H.; Lyons, Bernard J.; Smith-Johannsen, Robert; and Moyer, Wendell W., 4,534,889, Cl. 252-511.000.

Smith Kline & French Laboratories Limited: *See*—
Sach, George S., 4,535,163, Cl. 546-300.000.

Smith, Leland B.; and Jackson, Jacqueline J., to Hemotec, Inc. Gas flow cartridge with improved coagulation detection and expanded analytical test capability. 4,534,939, Cl. 422-61.000.

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Potter, William D., 4,534,355, Cl. 128-635.000.

Smith, Paul D.: *See*—
McDaniel, Max P.; Johnson, Marvin M.; Hawley, Gil R.; Westerman, John; and Smith, Paul D., 4,535,070, Cl. 502-208.000.

Smith, Raymond H. Fluid operating device. 4,534,714, Cl. 417-416.000.

Smith, Richard J., to USM Corporation. Stroke control for press. 4,534,249, Cl. 83-74.000.

Smith, Russell D., to Red Plastic Co., Inc. Spring assisted doors for sidewalk, pit and floor openings. 4,534,132, Cl. 49-386.000.

Smith, Van Z., to Time Manufacturing Company. Insulated boom structure for telescoping aerial lift. 4,534,444, Cl. 182-2.000.

Smith, Walter P.: *See*—
Herstein, Morris S.; Smith, Walter P.; and Hawkins, Geoffrey R., 4,534,964, Cl. 424-70.000.

Snow, Arthur W.: *See*—
Kovacina, Thomas A.; DeMarco, Ronald A.; and Snow, Arthur W., 4,535,011, Cl. 427-255.600.

Snyder Laboratories, Inc.: *See*—
Todd, Edward P.; and Weilbacher, Eugene E., 4,534,765, Cl. 604-321.000.

Snyder, Walter W., to National Can Corporation. Cup feeding mechanism. 4,534,202, Cl. 72-349.000.

Societa Italiana Vetro-SIV-S.p.A.: *See*—
Massarelli, Liberto; and Capriotti, Luigi, 4,535,438, Cl. 369-264.000.

Societe Anonyme D. B. A.: *See*—
Meynier, Guy, 4,534,170, Cl. 60-547.100.
Tanguy, Christian, 4,534,382, Cl. 137-627.500.

Societe anonyme dite: Alsthom-Atlantique: *See*—
Lecoffre, Yves; and Marcoz, Jean, 4,534,774, Cl. 55-44.000.

Societe Anonyme dite: Etude de Realisation de Chaines Automatiques ERCA: *See*—
Hautemont, Jean-Claude H., 4,534,494, Cl. 222-148.000.

Societe Anonyme dite: L'Oreal: *See*—
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Societe Anonyme Francaise Du Ferodo: *See*—
Cadars, Patrick, 4,534,409, Cl. 165-109.00T.

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Grasset, Daniel; and Martinot, Bernard, 4,534,942, Cl. 422-117.000.

Societe d'Etudes et Installations Industrielles CNUD S.A.: *See*—
Cemin, Hans, 4,534,780, Cl. 65-348.000.

Societe Nationale des Poudres et Explosifs: *See*—
Lecolier, Serge L. M. B.; and Raynal, Serge F., 4,535,135, Cl. 526-174.000.

Societe Nationale Elf Aquitaine (Production): *See*—
Favie, Claude; and Mercadier, Michel, 4,535,130, Cl. 525-327.300.

Soderberg, John H.: *See*—
Duwel, Edward C.; and Soderberg, John H., 4,535,421, Cl. 364-900.000.
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Uemura, Seiichi; Hirose, Takao; and Sohda, Yoshio, 4,534,950, Cl. 423-447.400.

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Nicolas, Edgard; and Merckaert, Louis, 4,534,837, Cl. 204-129.000.

Somers, Robert I., to Black & Decker, Inc. Chuck key. 4,534,573, Cl. 279-1.00K.

Someya, Hiromi: *See*—
Konishi, Yuichiro; Tsunekawa, Tokuichi; and Someya, Hiromi, 4,534,639, Cl. 354-432.000.

Sonnenberg, Joseph, to Raychem Corporation. Flame retardants and compositions containing them. 4,535,170, Cl. 548-462.000.

Sony Corporation: *See*—
Kishi, Yoshio, 4,535,434, Cl. 369-111.000.
Yamano, Yuzo; and Oozeki, Hikaru, 4,534,215, Cl. 73-862.440.
Yokoya, Satoshi; Numata, Norio; and Shimizu, Ikuo, 4,535,470, Cl. 381-15.000.

Sorathia, Usman A. K.: *See*—
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Fujimura, Gen; Sotoma, Koichi; Kunikyo, Hiroshi; Hata, Masahito; and Inoue, Hidesuke, 4,534,284, Cl. 99-498.000.

Soukup, Thomas M. Carbon fiber pacing electrode. 4,534,366, Cl. 128-786.000.

South African Inventions Development Corp.: *See*—
Hunt, Michael S., 4,534,169, Cl. 60-414.000.

Southern Railway Company: *See*—
Stubbs, John L.; and Loflin, Carl B., 4,534,296, Cl. 104-8.000.

Spada, John A.: *See*—
Ward, Charles S.; Laton, Richard W.; and Spada, John A., 4,535,302, Cl. 330-287.000.

Spademan, Richard G. Tooth cleaning bristle and holder. 4,534,081, Cl. 15-167.00R.

Sparre, Preben C.: *See*—
Loegstrup, Joergen; and Sparre, Preben C., 4,534,612, Cl. 339-255.00P.

Spatz, David M., to Chevron Research Company. N-Substituted phenoxyacetamide fungicides. 4,535,087, Cl. 514-352.000.

Spector, George: *See*—
Berry, James B.; and Spector, George, 4,534,185, Cl. 63-1.00R.

Speed Queen Company: *See*—
Fey, Robert M., 4,534,188, Cl. 68-3.00R.

Spence, Robert L. Spool retaining device. 4,534,522, Cl. 242-172.000.

Sperry, Charles R.: *See*—
Akers, Michael J.; Hargrove, William W.; Harris, Dale C.; and Sperry, Charles R., 4,534,758, Cl. 604-85.000.

Sperry Corporation: *See*—
Fung, Anthony K., 4,535,420, Cl. 364-900.000.
Scott, Fred J.; and Walker, Gary W., 4,534,608, Cl. 339-91.00R.
Underhill, Kenneth R., 4,534,285, Cl. 100-88.000.

Spilde, Rodney L. Livestock confinement building wall-vent controller. 4,534,278, Cl. 98-37.000.

Sprague Electric Company: *See*—
Buczkowski, Gary J.; and Fresia, E. James, 4,535,389, Cl. 361-433.000.

Sprecher & Schuh AG: *See*—
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Sprecker, Mark A.; Wiegers, Wilhelmus J.; Belko, Robert P.; and Boden, Richard M., to International Flavors & Fragrances Inc. Uses of para-acyloxycyclohexyl alkylcarboxylates in augmenting or enhancing the organoleptic properties of consumable materials. 4,534,890, Cl. 252-522.00R.

Springs Industries, Inc.: *See*—
Payet, George L.; and Ballard, Stephen C., 4,534,819, Cl. 156-515.000.

Square D Company: *See*—
Schubring, Allin W.; and Sehmer, Robert W., 4,535,310, Cl. 335-61.000.

Squicciarini, Gaetano N., to AT&T Information Systems Inc. Digital terminal keyboard dialing. 4,535,198, Cl. 179-2.0DP.

Squire, Edward N., to Du Pont de Nemours, E. I., and Company. Fluorodioxoles. 4,535,175, Cl. 549-455.000.

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Kryger, Allen C., 4,534,991, Cl. 426-592.000.

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Stade, Kurt, to AUTOMATIK Apparate-Maschinenbau H. Hench GmbH. Multishafted, continuous mixing and kneading of plastifiable materials. 4,534,652, Cl. 366-85.000.
Stafford, John P.: *See—*
DuPont, Preston S.; Ritter, Robert E.; and Stafford, John P., 4,534,998, Cl. 427-122.000.
Staib, Philippe H.: *See—*
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de Lorenzo, Mark X.; Hoffpauir, Charles R.; Hutchins, Johnnie R.; Meyer, Timmy R.; Page, John E.; and Poehl, Michael E., 4,535,134, Cl. 526-88.000.
Howe, Arthur T., 4,534,099, Cl. 29-572.000.
Pocock, John F. E.; Cole, Charles A.; Villanueva, James G.; Matlack, John D.; and Lewis, Shelton E., 4,534,995, Cl. 427-38.000.
Stanich, Judith A. Padlock cover. 4,534,190, Cl. 70-54.000.
Stanley, Thomas R., to Teepak, Inc. Meat stuffing apparatus. 4,534,084, Cl. 17-39.000.
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Jacobs, Barry A.; and Fesman, Gerald, 4,535,096, Cl. 521-107.000.
Stecura, Stephan, to United States of America, National Aeronautics and Space Administration. Thermal barrier coating system. 4,535,033, Cl. 428-633.000.
Steel, Henry J. Combination weighing machines and method. 4,534,430, Cl. 177-25.000.
Steen, Conrad, to Crown Zellerbach Corporation. Paper stock diffuser system. 4,534,399, Cl. 162-212.000.
Steer, Peter L.; and Edwards, John V., to Craig Medical Products Limited. Drainage bag for urine and support therefor. 4,534,766, Cl. 604-323.000.
Steinberg, David H.; Seltzer, Raymond; Luzzi, John J.; and Cortolano, Frank P., to Ciba-Geigy Corporation. Anti-oxidative, anti-thermal, and anti-actinic degradation amides of hydroxyphenylalkylthio alkanoic acids, compositions, and method of use therefor. 4,534,874, Cl. 252-51.50A.
Stephen, David; Mansbridge, Martin H.; and Highnam, Alan W., to British Aerospace Public Limited Company. Stiffened panel. 4,534,503, Cl. 228-157.000.
Stephens, Donald E.; and Ehret, Robert J., to Beckman Instruments, Inc. Analytical instrument thermoelectric temperature regulator. 4,534,941, Cl. 422-70.000.
Stepp, Elvin D.; and Claypoole, Gary L., to Cincinnati Electronics Corporation. Digital clock bit synchronizer. 4,535,461, Cl. 375-110.000.
Stern, Hansjoerg: *See—*
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Stewart, Thomas M. Fish filleting system. 4,534,085, Cl. 17-46.000.
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Stieg, Richard F., to Gates Rubber Company, The. Alternating rotary to reciprocating actuator. 4,534,232, Cl. 74-89.200.
Stieg, Richard F.; Dolan, John P.; Worley, W. Spencer; and Gerbert, Goran, to Gates Rubber Company, The. Variable speed belt driven transmission system and method. 4,534,748, Cl. 474-17.000.
Stockburger, Hermann; and Winderlich, Hans-Georg. Data carrier controlled data processing. 4,535,418, Cl. 364-900.000.
Stocking, George E.; and Pohl, Walter J., to General Electric Company. Air conditioning apparatus. 4,534,179, Cl. 62-128.000.
Stocking, William B. Propulsion plant for air-cushioned vehicles. 4,534,434, Cl. 180-120.000.
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Strauch, Heinz, deceased: *See—*
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Streckel, Willi: *See—*
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Streckmann, George L.; and Harris, Ralph A., to Texas Instruments Incorporated. Compound floating point amplifier. 4,535,299, Cl. 330-279.000.
Streckmann, George L., to Texas Instruments Incorporated. Extended range sample and hold circuit. 4,535,300, Cl. 330-279.000.
Strohmaier, Ernst, to Kaltenbach & Voigt GmbH & Co. Dental handpiece. 4,534,732, Cl. 433-29.000.
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Stubbs, John L.; and Loflin, Carl B., to Southern Railway Company. Rail gauger. 4,534,296, Cl. 104-8.000.
Stuckey, William C. Plant support. 4,534,129, Cl. 47-47.000.
Stump, Paul O.; and Taylor, Calvin G., to Eaton Corporation. Wafer transport system. 4,534,695, Cl. 414-749.000.
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Stuska, Gotthard: *See—*
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Cochrane, Douglas A., Jr.; and Styer, Fred W., 4,535,430, Cl. 367-133.000.
Subramanian, Naranammalpuram S. Pressure cookers having vent means. 4,534,485, Cl. 220-203.000.
Sud Chemie Aktiengesellschaft: *See—*
Schneider, Michael; Kochloefl, Karel; and Ladebeck, Jurgen, 4,535,071, Cl. 502-342.000.
Suenaga, Nobuyuki: *See—*
Inoue, Hitosi; Suenaga, Norihiro; and Suenaga, Nobuyuki, 4,535,458, Cl. 372-25.000.
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Sugawara, Saburo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focusing device for camera. 4,534,636, Cl. 354-403.000.
Sugimori, Shigeru; Kojima, Tetsuhiko; Isoyama, Toyoshiro; and Nigorikawa, Kazunori, to Chisso Corporation. 4-Unsubstituted or substituted-4 cyanotercyclohexane derivatives. 4,534,883, Cl. 252-299.630.
Sugimori, Yoshiaki: *See—*
Kitayama, Masayasu; Sugimori, Yoshiaki; and Ohta, Schunich, 4,535,072, Cl. 502-411.000.
Sugimori, Yoshio: *See—*
Nakagawa, Koichi; Sugimori, Yoshio; Kimata, Yoshihide; Araki, Yosai; and Arai, Tomoji, 4,535,356, Cl. 358-145.000.
Sugimoto, Tatsuyoshi: *See—*
Kurono, Hitoshi; Taninaka, Kuniaki; Sugimoto, Tatsuyoshi; and Katoh, Minoru, 4,535,075, Cl. 514-96.000.
Sugimoto, Yoshifumi: *See—*
Yokogi, Masanobu; Sugimoto, Yoshifumi; and Ono, Yotsuo, 4,535,028, Cl. 428-398.000.
Sugimura, Masao: *See—*
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Sugimura, Masao, 4,535,335, Cl. 340-995.000.
Sugiura, Susumu: *See—*
Toda, Katuhiko; and Sugiura, Susumu, 4,534,624, Cl. 350-429.000.
Sugrue, John C.: *See—*
Jahnke, William R.; Rockel, Bruce H.; Brown, Barry J.; Hawley, Floyd E.; Pennella, Andrew J.; Sugrue, John C.; and Wiggins, William R., 4,534,093, Cl. 29-26.00A.
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Park, Chung P.; and Suh, Kyung W., 4,535,094, Cl. 521-79.000.
Sukhodolets, Vadim K.: *See—*
Rabinovich, Lev M.; Jurovsky, Albert Y.; Brodkin, Jury M.; Puginsky, Viktor A.; Iordan, Georgy G.; Serdjukov, Vilen I.; Sukhodolets, Vadim K.; Tikhnova, Galina V.; and Golikova, Galina M., 4,535,283, Cl. 323-365.000.
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Mittleman, Herbert; and Sulek, Stanislaw, 4,534,764, Cl. 604-81.000.
Suling, Carlhans: *See—*
Brauer, Wolfgang; Korte, Siegfried; Neukam, Theo; and Suling, Carlhans, 4,535,139, Cl. 526-287.000.
Sullivan, Hack A., to Sullivan Mfg. & Sales Corp. Flocking apparatus. 4,534,511, Cl. 239-336.000.
Sullivan Mfg. & Sales Corp.: *See—*
Sullivan, Hack A., 4,534,511, Cl. 239-336.000.
Sullivan, William B., Jr., to Raytheon Company. Radio frequency receiver. 4,535,286, Cl. 324-79.00R.
Sulzer Brothers Limited: *See—*
Pfarrwaller, Erwin, 4,534,386, Cl. 139-114.000.

Sumino, Fumio: *See—*
Ishikawa, Shozo; Toma, Hitoshi; and Sumino, Fumio, 4,535,043, Cl. 430-58.000.

Sumitomo Chemical Company, Limited: *See—*
Minai, Masayoshi; and Katsura, Tadashi, 4,535,182, Cl. 560-231.000.

Sumitomo Metal Industries, Ltd.: *See—*
Nakazato, Takuzo; Okuto, Koichiro; and Kai, Toshio, 4,534,678, Cl. 405-204.000.

Summers, David P., to Forerank, Inc. Valve incorporating deformable valve body. 4,534,541, Cl. 251-331.000.

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Santostasi, Paul A.; Dutt, Herbert V.; and Pirkau, Arno F., 4,534,480, Cl. 215-252.000.

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Cabus, Marcello M.; Howard, Billy D.; Colt, James W.; and Tuft, Edward S., 4,534,118, Cl. 34-34.000.

Sundberg, Donald C.; Bishop, Paul L.; and McBee, David G. Method and apparatus for reducing levels of organics in liquids. 4,534,865, Cl. 210-692.000.

Sundstrand Corporation: *See—*
Aldrich, Allyn M., 4,534,524, Cl. 244-17.250.
Blain, Edward S., 4,534,718, Cl. 418-55.000.

Superior Plastic Products Corp.: *See—*
Russo, Ronald D., 4,534,542, Cl. 251-342.000.

Suyama, Tadakazu: *See—*
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; and Suyama, Tadakazu, 4,534,978, Cl. 514-429.000.
Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,535,085, Cl. 514-290.000.

Suzuki, Isamu; and Hattori, Yoshio, to Toyo Electric Co., Ltd. Driving circuit for brushless D.C. motor. 4,535,274, Cl. 318-254.000.

Suzuki, Masayuki: *See—*
Ohara, Tsunemasa; Suzuki, Masayuki; and Yamamichi, Masayoshi, 4,534,633, Cl. 354-237.000.

Suzuki, Takashi; Matsumura, Susumu; and Ohtaka, Keiji, to Canon Kabushiki Kaisha. Camera with active optical range finder. 4,534,637, Cl. 354-403.000.

Suzuki, Toshio; Watanabe, Hiroshi; and Tsushima, Rikio, to Kao Corporation. Foaming liquid detergent composition having a stably dispersed water-insoluble fine powder. 4,534,892, Cl. 252-545.000.

Suzuki, Toshitake: *See—*
Arai, Naoto; Murakami, Takeshi; Suzuki, Toshitake; Saito, Toranosuke; Kitani, Masakatu; and Ishibashi, Takashi, 4,535,190, Cl. 568-721.000.

Suzuki, Yasuo: *See—*
Ohnishi, Haruo; Kosuzume, Hiroshi; Suzuki, Yasuo; and Mochida, Ei, 4,534,966, Cl. 424-94.000.

Swan, Thomas C. Fastening device for flexible sheets. 4,534,089, Cl. 24-559.000.

Sweeney, William J., to Engelhard Corporation. Animal litter container. 4,534,315, Cl. 119-1.000.

Swenson, Richard C., to United States of America, Navy. Safety mooring line. 4,534,262, Cl. 87-6.000.

Swiss Aluminium Ltd.: *See—*
Zdenek, Maly, 4,534,834, Cl. 204-28.000.

Sword, Anthony J.: *See—*
Hill, John W.; and Sword, Anthony J., 4,535,405, Cl. 364-400.000.

Sylven, Hans C. Inertia sensor in belt reels for vehicle belts. 4,534,521, Cl. 242-107.40A.

Szabo, Bela: *See—*
Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , 4,534,782, Cl. 71-21.000.

Szakasits, Julius J.; and Robinson, Robert E., to Shell Oil Company. Reformer process analyzer. 4,534,207, Cl. 73-23.100.

Szejtli, Jozsef; Fenyvesi, Eva; Zsadon, Bela; Szilasi, Maria; and Decsei, Lajos, to Chinoin, Gyogyszer Es Vegyeszeti Termekek Gyara Rt. Water soluble cyclodextrin polymers substituted by ionic groups and process for the preparation thereof. 4,535,152, Cl. 536-103.000.

Szepesi, Tamas S., to National Semiconductor Corporation. Regulated switched power circuit with resonant load. 4,535,399, Cl. 363-41.000.

Szilasi, Maria: *See—*
Szejtli, Jozsef; Fenyvesi, Eva; Zsadon, Bela; Szilasi, Maria; and Decsei, Lajos, 4,535,152, Cl. 536-103.000.

Szonntagh, Eugene L.: *See—*
Castleman, Bruce W.; McQuire, David P.; and Szonntagh, Eugene L., 4,534,777, Cl. 55-181.000.

Szopko, Mihaly: *See—*
Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , 4,534,782, Cl. 71-21.000.

T&N Materials Research Limited: *See—*
Atkinson, Alan W.; Dearden, Katryna J.; and Lancaster, Janet M., 4,534,922, Cl. 264-119.000.

Tabata, Yasushi; Ogawa, Kimiaki; and Takahashi, Toshimitsu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Erroneous release preventing device for camera. 4,534,634, Cl. 354-268.000.

Tabin, Clifford J.: *See—*
Weinberg, Robert A.; Tabin, Clifford J.; and Bradley, Scott M., 4,535,058, Cl. 435-6.000.

Tachikawa Spring Co., Ltd.: *See—*
Abe, Tadafumi; and Takahashi, Isao, 4,534,595, Cl. 297-452.000.

Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for visually indicating the travel route of an automotive vehicle. 4,535,334, Cl. 340-995.000.

Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Sugimura, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Fixed range indicating system for use in a vehicle travel path indicating apparatus. 4,535,335, Cl. 340-995.000.

Taguchi, Gyota; and Sato, Toshiji, to Nisshin Oil Mills, Ltd. Process for the production of soya protein flakes. 4,534,992, Cl. 426-656.000.

Taguchi, Masayuki, to Amada Company, Limited. Method and apparatus for controlling the feeding of a bandsaw blade in bandsaw machines. 4,534,247, Cl. 83-13.000.

Takabe, Seiichi: *See—*
Matsumoto, Kazuo; Takebe, Seiichi; and Takashima, Kohki, 4,535,089, Cl. 514-374.000.

Takagi, Toshinori: *See—*
Morimoto, Kiyoshi; and Takagi, Toshinori, 4,535,195, Cl. 136-261.000.

Takahashi, Isao: *See—*
Abe, Tadafumi; and Takahashi, Isao, 4,534,595, Cl. 297-452.000.

Takahashi, Katsuyu: *See—*
Fujimura, Takashi; Takahashi, Katsuyu; and Nishizawa, Masahiro, 4,535,234, Cl. 250-238.000.

Takahashi, Kenji; and Nakamura, Takashi, to Fuji Photo Film Co., Ltd. Radiation image recording and reproducing method. 4,535,237, Cl. 250-327.200.

Takahashi, Kenji; and Nakamura, Takashi, to Fuji Photo Film Co., Ltd. Radiation image recording and reproducing method. 4,535,238, Cl. 250-327.200.

Takahashi, Kenji: *See—*
Arakawa, Satoshi; Nakamura, Takashi; and Takahashi, Kenji, 4,534,884, Cl. 252-301.40H.

Takahashi, Masao: *See—*
Takeuchi, Fumio; Takahashi, Masao; Hattori, Katsuhide; and Sakai, Hiroshi, 4,534,809, Cl. 149-3.000.

Takahashi, Masashi; and Yamada, Minoru, to Nihon Sanso Kabushiki Kaisha; and Yamada, Minoru. Method and apparatus for producing vortex rings of a gas in a liquid. 4,534,914, Cl. 261-64.00B.

Takahashi, Takashi: *See—*
Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; and Furukawa, Osamu, 4,535,314, Cl. 338-21.000.

Takahashi, Takeshi: *See—*
Yamaoka, Yukinori; and Takahashi, Takeshi, 4,535,383, Cl. 361-341.000.

Takahashi, Toshimitsu: *See—*
Tabata, Yasushi; Ogawa, Kimiaki; and Takahashi, Toshimitsu, 4,534,634, Cl. 354-268.000.

Takahashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. System for diagnosing an internal combustion engine. 4,534,214, Cl. 73-118.000.

Takahashi, Toshio: *See—*
Makisumi, Yasuo; Murabayashi, Akira; Tawara, Katsuya; Watanabe, Yoshihachi; and Takahashi, Toshio, 4,535,088, Cl. 514-370.000.

Takahashi, Tsuneo: *See—*
Tagami, Katsutoshi; Takahashi, Tsuneo; Yasui, Shinichiro; and Ichikawa, Akira, 4,535,334, Cl. 340-995.000.
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Takahata, Kyoya: *See—*
Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, 4,534,975, Cl. 514-730.000.

Takaishi, Kazuhide; Kadonaga, Toshiki; Tamura, Masamitsu; Nakamura, Shigeharu; Mizoguchi, Mitsuru; Hirota, Yoshinobu; and Yamazaki, Yukinobu, to Kabushiki Kaisha Kobe Seiko Sho. Method and apparatus for produced stepped tubes. 4,534,199, Cl. 72-276.000.

Takano, Shouji: *See—*
Miura, Kunihiko; Takano, Shouji; and Kimura, Masashi, 4,534,642, Cl. 355-14.00E.

Takano, Yoshikazu: *See—*
Nakamura, Kosei; and Takano, Yoshikazu, 4,534,686, Cl. 409-135.000.

Takao, Seiji: *See—*
Kobashi, Toshiyuki; and Takao, Seiji, 4,535,027, Cl. 428-364.000.

Takashima, Kohki: *See—*
Matsumoto, Kazuo; Takabe, Seiichi; and Takashima, Kohki, 4,535,089, Cl. 514-374.000.

Takasu, Hotoyuki: *See—*
Sekizaki, Satoshi; Hosoya, Eiji; and Takasu, Hotoyuki, 4,534,440, Cl. 180-215.000.

Takayama, Kazuo, to Fujitsu Ten Limited. High frequency amplifier circuit. 4,535,301, Cl. 330-279.000.

Take, Hiroshi: *See—*
Koyanagi, Katubumi; Take, Hiroshi; and Uede, Hisashi, 4,535,329, Cl. 340-785.000.

Takeda Chemical Industries, Ltd.: *See—*
Nara, Kiyoshi; Katamoto, Kazuyoshi; and Ohta, Kazuhiko, 4,535,155, Cl. 544-20.000.

Takehara, Hideaki, to Victor Company of Japan, Limited. Stylus having a graphite electrode. 4,535,436, Cl. 369-173.000.

Takemura, Yukihito; and Niimi, Tomohide, to Toyota Jidosha Kabushiki Kaisha. Lock mechanism for the glovebox door of an automobile. 4,534,193, Cl. 70-218.000.

Takenaka, Masahico: *See—*
Shimazaki, Taiichi; and Takenaka, Masahico, 4,534,439, Cl. 180-215.000.

Takeuchi, Fumio; Takahashi, Masao; Hattori, Katsuhide; and Sakai, Hiroshi, to Nippon Oil and Fats Company Limited. Water-in-oil emulsion explosive composition. 4,534,809, Cl. 149-3.000.

Takihara, Yukio, to Hosiden Electronics Co., Ltd. Jack. 4,534,610, Cl. 339-206.00P.

Takizawa, Shozo: *See—*
Kobayashi, Kazuyoshi; and Takizawa, Shozo, 4,534,580, Cl. 280-712.000.

Takumi, Horiuchi: *See—*
Toshimasa, Kuroda; Akio, Kimura; Takumi, Horiuchi; Koki, Sasaki; and Terukuni, Ikuta, 4,534,164, Cl. 57-290.000.

Tamaki, Shigeo: *See—*
Hozumi, Kazuhiro; and Tamaki, Shigeo, 4,534,381, Cl. 137-625.650.

Tamm, Rolf G. A.; and Tomoff, Toma, to Bodenseewerk Perkin-Elmer & Co., GmbH. Device for atomizing a sample in flameless atomic absorption spectroscopy. 4,534,646, Cl. 356-312.000.

Tamura, Masamitsu: *See—*
Takaishi, Kazuhide; Kadonaga, Toshiki; Tamura, Masamitsu; Nakamura, Shigeharu; Mizoguchi, Mitsuru; Hirota, Yoshinobu; and Yamazaki, Yukinobu, 4,534,199, Cl. 72-276.000.

Tan, Swie-In: *See—*
Ainslie, Norman G.; and Tan, Swie-In, 4,534,811, Cl. 156-73.100.

Tan, Yoichi, to Fuji Xerox Co., Ltd. Digital signal repeating system. 4,535,450, Cl. 370-94.000.

Tanabe, Hisaki: *See—*
Umemoto, Hirotoshi; Tanabe, Hisaki; and Nakano, Shinji, 4,535,128, Cl. 525-162.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Matsumoto, Kazuo; Takabe, Seiichi; and Takashima, Kohki, 4,535,089, Cl. 514-374.000.

Tanaka, Fusatoshi, to Mazda Motor Corporation. Cam shaft holding system for internal combustion engine. 4,534,325, Cl. 123-90.270.

Tanaka, Kunio: *See—*
Kishi, Hajimu; Tanaka, Kunio; and Seki, Masaki, 4,535,408, Cl. 364-475.000.

Tanaka, Minoru; Nakamura, Hideo; and Mizuguchi, Shunji. Method for producing a composite sheet material. 4,535,009, Cl. 427-246.000.

Tanaka, Shuhei, to Hitachi Denshi Kabushiki Kaisha. Photodetector output circuit. 4,535,231, Cl. 250-201.000.

Tanaka, Sotaro: *See—*
Yagyu, Takashi; Yamaguchi, Takeshi; Tanaka, Sotaro; and Sakaki, Yasuo, 4,534,268, Cl. 91-6.000.

Tanaka, Syouji: *See—*
Yasuda, Takashi; Inoue, Naoyuki; and Tanaka, Syouji, 4,534,180, Cl. 62-141.000.

Tanguy, Christian, to Societe Anonyme D.B.A. Three-way solenoid valve. 4,534,382, Cl. 137-627.500.

Tanibuchi, Teruo; Ishiguchi, Koji; and Yamamoto, Shinji, to 501 UBE Industries, Ltd. Rubber composition for coating tire cord. 4,535,119, Cl. 524-496.000.

Taninaka, Kuniaki: *See—*
Kurono, Hitoshi; Taninaka, Kuniaki; Sugimoto, Tatsuyoshi; and Katoh, Minoru, 4,535,075, Cl. 514-96.000.

Tanizawa, Tetsu, to Fujitsu Limited. Transistor-transistor logic circuit with improved switching times. 4,535,258, Cl. 307-454.000.

Tao, John C.: *See—*
Roberts, George W.; and Tao, John C., 4,534,847, Cl. 208-8.0LE.

Targosz, Thomas C., to K. J. Law Engineers, Inc. Fully automatic penetration hardness tester. 4,534,212, Cl. 73-83.000.

Tarnoff, Sherwin S.; and Sano, Mikio. Recoil reducer. 4,534,264, Cl. 89-14.300.

Tartois, Claude: *See—*
Hajj Chehade, Mohammed; Lecat, Jean; and Tartois, Claude, 4,535,296, Cl. 329-103.000.

Tate & Lyle Public Limited Company: *See—*
Caus, Frans, 4,534,217, Cl. 73-178.00R.

Tawara, Katsuya: *See—*
Makisumi, Yasuo; Murabayashi, Akira; Tawara, Katsuya; Watanabe, Yoshihachi; and Takahashi, Toshio, 4,535,088, Cl. 514-370.000.

Taya, Akira: *See—*
Harada, Nozomu; Oana, Yasuhisa; Ogi, Keisuke; Izawa, Koji; Taya, Akira; and Sakamoto, Masanori, 4,534,622, Cl. 350-334.000.

Taylor, Calvin G.: *See—*
Stump, Paul O.; and Taylor, Calvin G., 4,534,695, Cl. 414-749.000.

Taylor, Jack R.: *See—*
Kelm, James S.; Vickers, Edward C.; Williams, Jesse J.; and Taylor, Jack R., 4,534,166, Cl. 60-39.230.

Taylor, Leonard S., to Research Corporation. Microwave coagulating scalpel. 4,534,347, Cl. 128-303.100.

Techne Corporation: *See—*
de Bruyne, Norman A., 4,534,656, Cl. 366-247.000.

Technic, Inc.: *See—*
Johnson, Frank; Reese, Dieter; and Hirbour, Louis, 4,534,843, Cl. 204-202.000.

Technical Processing Inc.: *See—*
Aguirre, Juan E., 4,534,799, Cl. 106-270.000.

Technicare Corporation: *See—*
Fife, Michael J.; Diaz, Paul T.; and Dietz, Dennis R., 4,534,221, Cl. 73-626.000.

Technique et Esthetique pour l'Industrie et la Distribution: *See—*
Ducros, Guy, 4,534,377, Cl. 137-212.000.

Teepak, Inc.: *See—*
Stanley, Thomas R., 4,534,084, Cl. 17-39.000.

Tefft, Stephen W.: *See—*
Fishter, Robert E.; McDaniel, Paul L.; and Tefft, Stephen W., 4,534,823, Cl. 156-626.000.

Teijin Limited: *See—*
Toshimasa, Kuroda; Akio, Kimura; Takumi, Horiuchi; Koki, Sasaki; and Terukuni, Ikuta, 4,534,164, Cl. 57-290.000.

Tektronix, Inc.: *See—*
Penney, Bruce J., 4,535,319, Cl. 340-347.0AD.
Penney, Bruce J., 4,535,357, Cl. 358-150.000.

Teledyne Industries, Inc.: *See—*
Kerr, Ronald R., deceased; Smith, David W.; and Trenary, John M., 4,534,340, Cl. 128-66.000.

Teleflex Incorporated: *See—*
Pritchard, Robert J.; and Lindenmuth, Kevin, 4,535,260, Cl. 310-12.000.

Telmec Co., Ltd.: *See—*
Asakawa, Teruo, 4,535,278, Cl. 318-687.000.

Temes, Steven D.: *See—*
Boden, Richard M.; Temes, Steven D.; Tyszkiewicz, Theodore J.; and Hanna, Marie R., 4,534,891, Cl. 252-522.00R.

Tenneco Oil Company: *See—*
Silverman, Michael A., 4,534,855, Cl. 208-253.000.

te Raa, Gerhardus A.: *See—*
Magendans, Frederik; te Raa, Gerhardus A.; and van Rheenen, Bernhard J. P., 4,534,993, Cl. 427-34.000.

Terry, Erwin N., to Byk Gulden Lomberg Chemische Fabrik GmbH. Combining an anionic blocking agent with dyphylline. 4,535,082, Cl. 514-264.000.

Terukuni, Ikuta: *See—*
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Testa, Raymond T.: *See—*
Labeda, David P.; Goodman, Joseph J.; Borders, Donald B.; Testa, Raymond T.; and Martin, John H. E. J., deceased, 4,534,970, Cl. 424-122.000.

Tetra Pak International AB: *See—*
Andersson, Thorbjorn, 4,534,248, Cl. 83-24.000.
Nilsson, Thorsten, 4,534,498, Cl. 226-181.000.

Texaco Inc.: *See—*
Cuscurida, Michael; and Waddill, Harold G., 4,535,133, Cl. 525-504.000.
Cuscurida, Michael, 4,535,189, Cl. 568-620.000.

Texas Instruments Incorporated: *See—*
Leach, Jerald G., 4,535,465, Cl. 377-46.000.
Penn, Thomas C., 4,535,401, Cl. 364-132.000.
Reid, Lee R., 4,535,424, Cl. 365-63.000.
Streckmann, George L.; and Harris, Ralph A., 4,535,299, Cl. 330-279.000.
Streckmann, George L., 4,535,300, Cl. 330-279.000.

Textron Inc.: *See—*
Jahnke, William R.; Rockel, Bruce H.; Brown, Barry J.; Hawley, Floyd E.; Pennella, Andrew J.; Sugrue, John C.; and Wiggins, William R., 4,534,093, Cl. 29-26.00A.

Tezuka, Chikao: *See—*
Mori, Masahiko; Arai, Kenichiro; and Tezuka, Chikao, 4,534,665, Cl. 400-145.200.

Theis, Christoph: *See—*
Peeters, Hermann; Vogt, Wilhelm; and Theis, Christoph, 4,534,910, Cl. 260-465.600.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Track tamping, leveling and lining operating unit. 4,534,295, Cl. 104-7.00B.

Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen Industriegesellschaft m.b.H. Ballast cleaning machine with two ballast screening installations. 4,534,415, Cl. 171-16.000.

Theurer, Josef, to Franz Plasser Bahnbaumasch Inenindustriegesellschaft m.b.H. Mobile rail contouring machine. 4,534,689, Cl. 409-296.000.

Thibodeaux, Devron P.: *See—*
Weiss, Louis C.; and Thibodeaux, Devron P., 4,534,856, Cl. 209-1.000.

Thibonnet, Bernard, to Thibonnet, Bernard; Staib, Philippe H.; and Babet, Jean-Michel. Induction device fitted inside a tank for drawing in fluids such as liquid fuels. 4,534,408, Cl. 165-108.000.

Thoma, Matthias, to Industrie Chemie Thoma GmbH & Co Produktions KG. Process for the production of guanidine nitrate from a mixture of urea and ammonium nitrate. 4,535,185, Cl. 564-242.000.

Thomas, Lowell E.: *See—*
Volpe, Luke; and Thomas, Lowell E., 4,534,814, Cl. 156-300.000.

Thomas, Paul E.; and Raley, Garland E., to Ethyl Corporation. Perforated film. 4,535,020, Cl. 428-131.000.

Thomson-CSF: *See—*
Bricot, Claude; Gerard, Jean Louis; and Audoin, Michel, 4,535,431, Cl. 369-44.000.
Hareng, Michel; Perbet, Jean-Noel; and Graciet, Michel, 4,535,327, Cl. 340-719.000.
Ravinet, Pierre; Claudepierre, Christian; Guillou, Denis; and Micheron, Francois, 4,535,205, Cl. 179-110.00A.

Thorn Emi Instruments Limited: *See—*
Marsh, Hugh R., 4,535,325, Cl. 340-636.000.

Thorvaldsen, Sverre L. Device for a casting float. 4,534,127, Cl. 43-41.200.

Thrum, Edmund Arthur: *See—*
Laursen, Donald, Jr., 4,534,559, Cl. 273-113.000.

Thurne Engineering Co. Ltd.: *See*—
Hoyland, Trevor B., 4,534,149, Cl. 53-76.000.
Tichy, James B. Down hole pump. 4,534,716, Cl. 417-469.000.
Tiitinen, Esko: *See*—
Schneck, Hans; and Tiitinen, Esko, 4,534,151, Cl. 53-415.000.
Tikhnova, Galina V.: *See*—
Rabinovich, Lev M.; Jurovsky, Albert Y.; Brodkin, Jury M.; Puginsky, Viktor A.; Iordan, Georgy G.; Serdjukov, Vilen I.; Sukhodolets, Vadim K.; Tikhnova, Galina V.; and Golikova, Galina M., 4,535,283, Cl. 323-365.000.
Time Manufacturing Company: *See*—
Smith, Van Z., 4,534,444, Cl. 182-2.000.
Timex Corporation: *See*—
D'Onofrio, Anthony; and Kitik, Walter, 4,534,743, Cl. 445-24.000.
Tisdale, Stephen L.: *See*—
King, David E.; Markovich, Voya; Sambucetti, Carlos J.; Tisdale, Stephen L.; and Trevitt, Donna J., 4,534,797, Cl. 106-1.230.
Tittes, Allan F.; Larson, Kenneth H.; and Britton, Kennith L., to Inspiration Consolidated Copper Company. Circumferential sealing assembly. 4,534,571, Cl. 277-128.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Izumi, Takayuki; Naito, Tsutomu; and Nakamura, Tomoo, 4,534,850, Cl. 208-22.000.
Tocco, Inc.: *See*—
Carter, Michael J., 4,535,211, Cl. 219-10.49R.
Sheetz, Richard S.; and Cachat, John F., 4,535,212, Cl. 219-10.770.
Toda, Katuhiko; and Sugiura, Susumu, to Canon Kabushiki Kaisha. Construction of lens barrel operated by electromagnetic induction. 4,534,624, Cl. 350-429.000.
Todd, Edward P.; and Weilbacher, Eugene E., to Snyder Laboratories, Inc. Modular drainage apparatus having excess negativity control. 4,534,765, Cl. 604-321.000.
Tokuyama Soda Kabushiki Kaisha: *See*—
Kusumoto, Koshi; Kawaguchi, Toshio; Nakahara, Takeshi; and Kunimoto, Shinichiro, 4,535,102, Cl. 523-116.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ariizumi, Shoji; Segawa, Makoto; and Masuoka, Fujio, 4,535,426, Cl. 365-182.000.
Endo, Tamotu, 4,535,378, Cl. 361-18.000.
Harada, Nozomu; Oana, Yasuhisa; Ogi, Keisuke; Izawa, Koji; Taya, Akira; and Sakamoto, Masanori, 4,534,622, Cl. 350-334.000.
Harada, Nozomu; and Yoshida, Okio, 4,535,363, Cl. 358-213.000.
Iwasaki, Kenji, 4,534,615, Cl. 350-6.100.
Kanai, Hideyuki; Takahashi, Takashi; Imai, Motomasa; and Furukawa, Osamu, 4,535,314, Cl. 338-21.000.
Kanda, Shuhei, 4,535,367, Cl. 360-10.200.
Matsuo, Kenji; and Yamaguchi, Akira, 4,535,305, Cl. 331-111.000.
Miura, Kunihiko; Takano, Shouji; and Kimura, Masashi, 4,534,642, Cl. 355-14.00E.
Ochii, Kiyofumi; Masuda, Masami; and Kondo, Takeo, 4,535,255, Cl. 307-264.000.
Sakata, Tomio, 4,535,473, Cl. 381-46.000.
Sawazaki, Norikazu, 4,535,369, Cl. 360-55.000.
Watanabe, Junji, 4,534,643, Cl. 355-3.0SH.
Toma, Hitoshi: *See*—
Ishikawa, Shozo; Toma, Hitoshi; and Sumino, Fumio, 4,535,043, Cl. 430-58.000.
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Yang, James H. C.; Tomaszewski, Walter; and Beneze , Heinz W., 4,534,145, Cl. 52-222.000.
Tomcik, James D., to AT&T Bell Laboratories. Adaptive bit allocator. 4,535,472, Cl. 381-31.000.
Tomich, Michael J., to General Electric Company. Blade containment structure. 4,534,698, Cl. 415-9.000.
Tommasi, Marcello: *See*—
Falzone, Vincenzo; and Tommasi, Marcello, 4,535,444, Cl. 370-58.000.
Tomoff, Toma: *See*—
Tamm, Rolf G. A.; and Tomoff, Toma, 4,534,646, Cl. 356-312.000.
Tomsa, Vladimir, to Allied Corporation. Connector assembly and coupling ring. 4,534,607, Cl. 339-89.00R.
Tone, Richard D. Archery arrow with freely rotational broad blade arrowhead to avoid windplaning. 4,534,568, Cl. 273-421.000.
Toray Industries, Inc.: *See*—
Yoshinaga, Minoru; Matsubara, Nobuyuki; and Yamamoto, Ryuichi, 4,534,920, Cl. 264-29.200.
Toray Silicone Co., Ltd.: *See*—
Hamada, Mitsuo; and Yasuda, Sadami, 4,534,815, Cl. 156-307.500.
Kondo, Hidetoshi; and Koshii, Taro, 4,535,109, Cl. 524-188.000.
Sasaki, Shosaku; and Kaiya, Nobuo, 4,535,123, Cl. 524-862.000.
Torneng, Eyvin: *See*—
Hansen, Helge; Nystrom, Borje; and Torneng, Eyvin, 4,534,976, Cl. 514-169.000.
Toshimasa, Kuroda; Akio, Kimura; Takumi, Horiuchi; Koki, Sasaki; and Terukuni, Ikuta, to Teijin Limited. Textured yarn and method and apparatus for producing the same. 4,534,164, Cl. 57-290.000.
Toub, Samuel G.; Gilliland, James L., Jr.; and Holder, Homer W. Oil collection/recirculation for vapor-compression refrigeration system. 4,534,182, Cl. 62-193.000.
Toyo Electric Co., Ltd.: *See*—
Suzuki, Isamu; and Hattori, Yoshio, 4,535,274, Cl. 318-254.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Nohara, Shigezo, 4,534,930, Cl. 264-513.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Oyama, Kiyotaka; and Harada, Tuneo, 4,534,909, Cl. 260-465.00G.
Toyota Jidosha Kabushiki Kaisha: *See*—
Takemura, Yukihito; and Niimi, Tomohide, 4,534,193, Cl. 70-218.000.
Tracy, John A., to Alcan International Limited. Apparatus for joining lengths of metal strip. 4,534,092, Cl. 29-21.100.
Train-A-Mation, Inc.: *See*—
Off, Joseph W. A.; and Ferguson, Vivian, 4,534,303, Cl. 112-114.000.
Trainer, Peter C. Scaffold clamp. 4,534,448, Cl. 403-396.000.
Transfer Print Foils, Inc.: *See*—
Parker, Harry A., 4,535,024, Cl. 428-200.000.
Trawoger, Werner. Valve for supplying, controlling and taking out a medium contained in an implanted container. 4,534,759, Cl. 604-117.000.
Trenary, John M.: *See*—
Kerr, Ronald R., deceased; Smith, David W.; and Trenary, John M., 4,534,340, Cl. 128-66.000.
Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. 3-Acylamino-2-oxoazetidine-1-(β-oxopropionic acid). 4,534,896, Cl. 260-239.00A.
Trevitt, Donna J.: *See*—
King, David E.; Markovich, Voya; Sambucetti, Carlos J.; Tisdale, Stephen L.; and Trevitt, Donna J., 4,534,797, Cl. 106-1.230.
Trezl, Lajos: *See*—
Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , 4,534,782, Cl. 71-21.000.
Trimedyne, Inc.: *See*—
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Trio Kabushiki Kaisha: *See*—
Hiranuma, Satoshi, 4,535,437, Cl. 369-223.000.
Triumph-Adler Aktiengesellschaft fur Buro- and Informationstechnik: *See*—
Hildel, Heinz; Schnell, Wolfgang; and Westphal, Gerald, 4,534,668, Cl. 400-477.000.
Tropeano, Joseph C.; Tropeano, Joseph T.; and Tropeano, Thomas F. Method and apparatus for removing condensate and oil particles from a stream of compressed air used in the production of snow. 4,534,178, Cl. 62-124.000.
Tropeano, Joseph T.: *See*—
Tropeano, Joseph C.; Tropeano, Joseph T.; and Tropeano, Thomas F., 4,534,178, Cl. 62-124.000.
Tropeano, Thomas F.: *See*—
Tropeano, Joseph C.; Tropeano, Joseph T.; and Tropeano, Thomas F., 4,534,178, Cl. 62-124.000.
Troxler, Eduard; Kainmuller, Thomas; and Maul, Rudolf, to Ciba-Geigy Corporation. Process for the preparation of polyesters from aliphatic dicarboxylic acids and polyalkylpiperidyl diols. 4,535,145, Cl. 528-289.000.
Trudel, Murray L.: *See*—
Dham, Vinod K.; Honnigford, Edward H.; Stewart, John K., Jr.; Pfeifer, Robert F.; and Trudel, Murray L., 4,534,104, Cl. 29-571.000.
Trustee, Bill L.: *See*—
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Trutek Research, Inc.: *See*—
Nowacki, Christopher; and Brisson, Alfred G., 4,534,343, Cl. 128-200.230.
Tschetter, Charles D.; and Bergman, Rolf S., to General Electric Company. Incandescent lamp. 4,535,269, Cl. 313-579.000.
Tsuboi, Shinichi: *See*—
Saito, Junichi; Kudamatsu, Akio; Kume, Toyohiko; and Tsuboi, Shinichi, 4,535,076, Cl. 514-128.000.
Tsuda, Yoshio: *See*—
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Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, 4,535,085, Cl. 514-290.000.
Tsukamoto, Hiroaki, to Honda Giken Kogyo Kabushiki Kaisha. Means for supplying a secondary air in an internal combustion engine which is provided with a turbo charger. 4,534,173, Cl. 60-606.000.
Tsukamoto, Kou; and Hirate, Masatoshi, to CKD Controls Limited. Smallsize motor with reduction gear and clutch mechanism. 4,535,261, Cl. 310-78.000.
Tsukii, Toshikazu. Microwave circuit device package. 4,535,307, Cl. 333-35.000.
Tsunekawa, Tokuichi: *See*—
Konishi, Yuichiro; Tsunekawa, Tokuichi; and Someya, Hiromi, 4,534,639, Cl. 354-432.000.
Tsushima, Rikio: *See*—
Suzuki, Toshio; Watanabe, Hiroshi; and Tsushima, Rikio, 4,534,892, Cl. 252-545.000.
Tuchiya, Isamu: *See*—
Fukui, Yoshihiro; Tuchiya, Isamu; and Yoshida, Shun, 4,534,812, Cl. 156-132.000.
Tucker, Maurice K., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Transportable folding bridge. 4,534,079, Cl. 14-14.000.
Tuda, Goro, to Kabushiki Kaisha Kobe Seiko Sho. Multi-articulate arm mechanism. 4,534,694, Cl. 414-735.000.

Tuft, Edward S.: *See*—
Cabus, Marcello M.; Howard, Billy D.; Colt, James W.; and Tuft, Edward S., 4,534,118, Cl. 34-34.000.
Tullis, Barclay J., to Hewlett-Packard Company. Interlocking door latch for dockable interface for integrated circuit processing. 4,534,389, Cl. 141-98.000.
Turner, Rudolf, to Zenith Electronics Corporation. Vertical reference signal identification system. 4,535,353, Cl. 358-21.00V.
Twardowski, Joseph W., to Chamberlain Manufacturing Corporation. Transmitter and receiver for controlling remote elements. 4,535,333, Cl. 340-825.690.
Tyihak, Erno : *See*—
Rusznak, Istvan; Trezl, Lajos; Foldesi, Dezso ; Szabo, Bela; Bodi, Imre; Csaszar, Szilveszter; Szopko, Mihaly; Gombar, Mihaly; Kovacs, Gabriella; and Tyihak, Erno , 4,534,782, Cl. 71-21.000.
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Tyszkiewicz, Theodore J.: *See*—
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Ube Industries, Ltd.: *See*—
Inaike, Toshihiro; Yamamoto, Shuji; Ohe, Shunji; and Otsuka, Kazunori, 4,535,105, Cl. 524-104.000.
Udd, Eric: *See*—
Finch, George W.; and Udd, Eric, 4,534,222, Cl. 73-653.000.
Ueda, Minoru; Iyehara, Sadahiro; Masuda, Mitsuya; Inohara, Shizuo; and Yamamoto, Keisuke, to Matsushita Electric Industrial Co., Ltd. Image display apparatus. 4,535,272, Cl. 315-366.000.
Uede, Hisashi: *See*—
Koyanagi, Katubumi; Take, Hiroshi; and Uede, Hisashi, 4,535,329, Cl. 340-785.000.
Uehara, Yumito: *See*—
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Uekusa, Yasuyuki: *See*—
Kamijo, Ken; and Uekusa, Yasuyuki, 4,534,441, Cl. 180-268.000.
Uemura, Seiichi; Hirose, Takao; and Sohda, Yoshio, to Nippon Oil Co., Ltd. Process for producing carbon fibers. 4,534,950, Cl. 423-447.400.
Ueno, Sadayasu, to Hitachi, Ltd. Thermal flow meter. 4,534,218, Cl. 73-204.000.
Ukigai, Toshiyuki: *See*—
Morita, Hiroshi; Kawada, Yasuyuki; Yamada, Junichi; and Ukigai, Toshiyuki, 4,534,411, Cl. 166-274.000.
Umemoto, Hirotoshi; Tanabe, Hisaki; and Nakano, Shinji. Polycarboxylic-alkyleneimine resinous composition and coating composition containing same. 4,535,128, Cl. 525-162.000.
Underhill, Kenneth R., to Sperry Corporation. Actuator mechanism for continuous roll baling machine. 4,534,285, Cl. 100-88.000.
Union Carbide Corporation: *See*—
Broady, Floyd J.; and Jasek, J. Rondal, 4,534,887, Cl. 252-503.000.
Foster, George N.; and Metzler, Richard B., 4,535,113, Cl. 524-262.000.
Kortovich, James W.; and Micinski, Eugene, 4,534,951, Cl. 423-448.000.
Long, Gary N.; Pellet, Regis J.; and Rabo, Jule A., 4,534,853, Cl. 208-120.000.
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Union Oil Company of California: *See*—
Dovan, Hoai T.; and Hutchins, Richard D., 4,534,412, Cl. 166-295.000.
Unipart Group, Limited: *See*—
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Unique Oil Tools, Inc.: *See*—
Hooper, David W., 4,534,426, Cl. 175-65.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
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Elliott, Charles T.; White, Anthony M.; and Field, Howard J., 4,535,232, Cl. 250-206.000.
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United States of America
Agriculture: *See*—
Schade, John E.; and King, A. Douglas, Jr., 4,535,248, Cl. 250-459.100.
Weiss, Louis C.; and Thibodeaux, Devron P., 4,534,856, Cl. 209-1.000.
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Bomberger, Howard B.; and Froes, Francis H., 4,534,938, Cl. 420-590.000.
Buckley, John J.; and Scott, William T., 4,534,538, Cl. 251-62.000.
Eylon, Daniel; and Froes, Francis H., 4,534,808, Cl. 148-133.000.
Lane, Clyde H., 4,534,100, Cl. 29-586.000.
Palvolgyi, Frank A., 4,535,466, Cl. 377-54.000.
Schlie, LaVerne A.; and Rathge, Robert D., 4,535,457, Cl. 372-58.000.
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Keefer, Larry K.; and Lunn, George, 4,535,154, Cl. 544-106.000.
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Horn, Stuart B.; Wright, Richard A.; and Dunmire, Howard L., 4,534,176, Cl. 62-6.000.
Knapp, Charles A., 4,534,810, Cl. 149-19.600.
Phillippi, R. Michael; and Drzewiecki, Thadeusz M., 4,534,383, Cl. 137-840.000.
Schmidt, Jimmy Q., 4,535,462, Cl. 377-2.000.
Sollott, Gilbert P.; and Gilbert, Everett E., 4,535,193, Cl. 568-941.000.
Van Caneghem, Rene J., 4,534,205, Cl. 73-12.000.
Wilson, Ben F., 4,534,293, Cl. 102-289.000.
Energy: *See*—
Fields, Stanley R., 4,535,250, Cl. 250-507.100.
Nielsen, Marshall G., 4,534,709, Cl. 417-65.000.
Yoldas, Bulent E.; and Partlow, Deborah P., 4,535,026, Cl. 428-310.500.
National Aeronautics and Space Administration: *See*—
Kelm, James S.; Vickers, Edward C.; Williams, Jesse J.; and Taylor, Jack R., 4,534,166, Cl. 60-39.230.
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Burchfield, William L.; Carr, Edward L.; and Laskowski, Gordon J., 4,534,476, Cl. 212-190.000.
Cangialosi, Arthur D., 4,534,648, Cl. 356-350.000.
Crosbie, Richard J.; and Edwards, Paul R., 4,534,338, Cl. 128-1.00A.
Kovacina, Thomas A.; DeMarco, Ronald A.; and Snow, Arthur W., 4,535,011, Cl. 427-255.600.
McManis, George E., III; Fletcher, Aaron N.; and Miles, Melvin H., 4,535,037, Cl. 429-103.000.
Swenson, Richard C., 4,534,262, Cl. 87-6.000.
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Wilger, John F.; Nakano, Gregory S.; Orillo, Stephen, Jr.; and Cazinha, John R., 4,534,135, Cl. 51-241.00S.
U.S. Philips Corporation: *See*—
Arragon, Jean-Pierre, 4,535,449, Cl. 370-86.000.
Brandt, Cornelis G., 4,535,469, Cl. 378-081.000.
Bruggendieck, Siegfried, 4,534,618, Cl. 350-96.230.
Drupsteen, Jan, 4,535,451, Cl. 370-99.000.
Duijkers, Peter A., 4,535,358, Cl. 358-158.000.
Gerot, Guy J. C., 4,535,362, Cl. 358-194.100.
Hajj Chehade, Mohammed; Lecat, Jean; and Tartois, Claude, 4,535,296, Cl. 329-103.000.
Himmelbauer, Alain J.; and Foubelle, Regis J. P., 4,535,200, Cl. 179-2.0EA.
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Magendans, Frederik; te Raa, Gerhardus A.; and van Rheenen, Bernhard J. P., 4,534,993, Cl. 427-34.000.
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Schoofs, Franciscus A. C. M.; and Nijman, Aloysius J., 4,535,303, Cl. 330-297.000.
Van der Heijde, Martin C., 4,535,313, Cl. 335-212.000.
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Zonneveld, Frans W.; and Kramer, Cornelis, 4,535,245, Cl. 250-385.000.
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Mekjian, Aram, 4,535,146, Cl. 528-295.300.
United States Surgical Corporation: *See*—
Korthoff, Herbert W., 4,534,352, Cl. 128-334.00C.
United Technologies Corporation: *See*—
Ericksen, James P.; and Stack, Timothy F., 4,535,294, Cl. 328-150.000.
Fasano, Anthony; Roberts, John H.; and Motycka, David L., 4,534,216, Cl. 73-147.000.
Fishter, Robert E.; McDaniel, Paul L.; and Tefft, Stephen W., 4,534,823, Cl. 156-626.000.
Johnson, Raymond G., Jr.; Trustee, Bill L.; and Fischer, William C., 4,534,702, Cl. 416-20.00R.
Metzger, Frederick B.; and Magliozzi, Bernard, 4,534,526, Cl. 244-38.000.
Universal Medical Products, Inc.: *See*—
Bonner, Francis J., Jr.; and Bonner, Francis J., III, 4,534,354, Cl. 128-402.000.
Universal Skate Sharpeners Ltd.: *See*—
Consay, Joseph A.; and Meier, Douglas R., 4,534,134, Cl. 51-96.000.
University of Illinois, The Board of Trustees of the: *See*—
Krstenansky, John L.; and Currie, Bruce L., 4,535,169, Cl. 548-453.000.
University of Illinois Foundation: *See*—
Chakrabarty, Ananda M.; and Kellogg, Scott T., 4,535,061, Cl. 435-253.000.
University of Minnesota, Regents of the: *See*—
Fisher, Jed F., 4,534,971, Cl. 514-21.000.
University of South Alabama: *See*—
Sikes, C. Steven; and Wheeler, Alfred P., 4,534,881, Cl. 252-180.000.
University Patents, Inc.: *See*—
Schumacher, Gebhard F. B. A.; and Usala, Stephen J., 4,534,362, Cl. 128-738.000.

Unseki, Takashi: *See—*
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Unterberger, Hans: *See—*
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UOP Inc.: *See—*
Cleary, Michael T., 4,534,900, Cl. 260-428.500.

Upjohn Company, The: *See—*
Moon, Malcolm W., 4,534,897, Cl. 260-239.30R.
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Ura, Frank: *See—*
Wright, Conrad L.; Bearrs, James G.; Chan, C. S.; Hay, Robert R.; and Ura, Frank, 4,535,343, Cl. 346-140.00R.

Urion, Kenard E.: *See—*
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Usala, Stephen J.: *See—*
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Ushio Denki Kabushiki Kaisha: *See—*
Mimura, Yoshiki; Arai, Tetsuji; Shimizu, Hiroshi; and Fukuda, Satoru, 4,535,228, Cl. 219-411.000.
Shimizu, Hiroshi, 4,535,227, Cl. 219-411.000.

USM Corporation: *See—*
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USV Pharmaceutical Corp.: *See—*
Golec, Frederick A., Jr.; and Goetzen, Thomas, 4,535,177, Cl. 560-38.000.
Loev, Bernard; Chan, Wan-Kit; and Jones, Howard, 4,534,979, Cl. 514-529.000.

Utah State University Foundation: *See—*
Bourcier, Denis R., 4,534,940, Cl. 422-68.000.

van Belzen, David; Honig, Gunter; Lotterbach, Gerhard; van Woudenberg, Jan-Faas; and Zucker, Udo, to Robert Bosch GmbH. Control device for a fuel metering system of an internal combustion engine. 4,534,331, Cl. 123-492.000.

Van Caneghem, Rene J., to United States of America, Army. Method of shock testing aluminum alloy welded joints. 4,534,205, Cl. 73-12.000.

Van der Heijde, Martin C., to U.S. Philips Corporation. Electromagnetic deflection unit and color display tube provided with such a unit. 4,535,313, Cl. 335-212.000.

Vanderlaan, Robert D., to Pneumo Corporation. Control actuation system including staged direct drive valve with fault control. 4,534,273, Cl. 91-510.000.

Van der Mast, Victor C.: *See—*
Awerbuch, Leon; and Van der Mast, Victor C., 4,534,174, Cl. 60-641.500.

VandeVelde, Noel. Device for tying-up an animal. 4,534,318, Cl. 119-147.00R.

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Vogt, Wilhelm: *See—*
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Vosper, George W. Sunglasses pivotally mounted on browbar of spectacle frame. 4,534,627, Cl. 351-47.000.

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More, Anton; Lang, Winfried; Riedle, Rudolf; Straussberger, Herbert; and Streckel, Willi, 4,534,791, Cl. 75-10.00R.

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Mitchell, Hal D.; Glover, Richard W.; Walker, Donald R.; and Rosenberg, Isadore, 4,534,068, Cl. 2-414.000.
Walker, Gary W.: *See*—
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Walter, Robert J.; and Gerik, Bernard J., to Rockwell International Corporation. Salt corrosion inhibitors. 4,534,794, Cl. 106-14.050.
Walz, Alfred. Metal powders and a process for the production thereof. 4,534,917, Cl. 264-12.000.
Wang, Fun-Den; and Yie, Gene G. Abrasive containing fluid jet drilling apparatus and process. 4,534,427, Cl. 175-67.000.
Wanner, William F. Pump apparatus. 4,534,713, Cl. 417-377.000.
Ward, Charles S.; Laton, Richard W.; and Spada, John A., to Raytheon Company. Microwave amplifier. 4,535,302, Cl. 330-287.000.
Ward, Cornelius S. Audio reproduction apparatus. 4,535,475, Cl. 381-88.000.
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Collins, Ian P.; and Fernie, Douglas P., 4,534,339, Cl. 128-6.000.
Warren Glen Products, Inc.: *See*—
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Washecheck, Don M.; and Adams, Charles T., to Shell Oil Company. Single-stage hydrotreating process for converting pitch to conversion process feedstock. 4,534,852, Cl. 208-89.000.
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Watanabe, Junji, to Tokyo Shibaura Denki Kabushiki Kaisha. Image forming apparatus. 4,534,643, Cl. 355-3.0SH.
Watanabe, Junji, to Kabushiki Kaisha Toshiba. Transfer material feeding device. 4,534,666, Cl. 400-207.000.
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Leloux, Arnoldus W. J., 4,534,184, Cl. 62-376.000.
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Weaver, Charles S., to Digital Recording Research Limited Partnership. Method and apparatus for digital Huffman decoding. 4,535,320, Cl. 340-347.0DD.
Weaver, Richard L. Silo unloading apparatus. 4,534,693, Cl. 414-307.000.
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Cullis, Anthony G.; Webber, Hugh C.; and Chew, Nigel G., 4,535,220, Cl. 219-121.0LM.
Weber, Adolf; Strauss, Hans; and Pauly, Hans, to Diehl GmbH & Co. Self-destruct device for spin-stabilized projectile detonators. 4,534,292, Cl. 102-241.000.
Wedel, John O., Jr. Method and apparatus to filter pulsed RF signals. 4,535,460, Cl. 375-104.000.
Wedemeyer, Robert C.; and Giebeler, Robert H., Jr., to Beckman Instruments, Inc. Vacuum pump purging apparatus. 4,534,861, Cl. 210-168.000.
Weichel, Ernst. Motor drive unit for forming self-driving agricultural implements of various structures. 4,534,432, Cl. 180-1.00T.
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Todd, Edward P.; and Weilbacher, Eugene E., 4,534,765, Cl. 604-321.000.
Weinberg, Harold N.; Savage, David W.; and Weissman, Walter, to Exxon Research and Engineering Co. Delayed coking with solvent separation of recycle oil. 4,534,854, Cl. 208-131.000.
Weinberg, Robert A.; Tabin, Clifford J.; and Bradley, Scott M., to Massachusetts Institute of Technology. Characterization of oncogenes and assays based thereon. 4,535,058, Cl. 435-6.000.
Weinberg, Zeev A., to International Business Machines Corporation. Non-volatile memory cell using a crystalline storage element with capacitively coupled sensing. 4,535,349, Cl. 357-23.600.
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Weiser, Harald: *See*—
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Weiss, Louis C.; and Thibodeaux, Devron P., to United States of America, Agriculture. Electrodynamic method for separating components. 4,534,856, Cl. 209-1.000.
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Krause, Robert F.; Rauch, Gary C.; and Kasner, William H., 4,535,218, Cl. 219-121.0LH.
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MacArthur, Alexander D.; and Everett, Harry J., 4,534,320, Cl. 122-406.00R.
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White, Johnnie W., to Bally Midway Mfg. Co. Electrical connector block. 4,534,609, Cl. 339-117.00R.
White, Malcolm J.: *See*—
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Whitlock, Robert R., to United States of America, Navy. Process for fabricating cryogenic targets and targets made thereby. 4,535,023, Cl. 428-195.000.
Wichterle, Otto, to Ceskoslovenska. Method for the preparation of hydrophilic gels by monomer casting. 4,534,916, Cl. 264-2.100.
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Holmes, Kenneth P., 4,535,271, Cl. 315-209.00R.
Wiedmann, Siegfried K., to International Business Machines Corporation. Highly integrated, high-speed memory with bipolar transistors. 4,535,425, Cl. 365-156.000.
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Wiggins Teape Group Limited, The: *See*—
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Wilger, John F.; Nakano, Gregory S.; Orillo, Stephen, Jr.; and Cazinha, John R., to United States of America, Navy. Grinding machine for watertight hatch lugs. 4,534,135, Cl. 51-241.00S.
Wilkes, Colin: *See—*
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Williamson, Geoffry H., to Imax Systems Corporation. Wide film transport and register movement. 4,534,630, Cl. 352-194.000.
Williamson, Robert D.; and Furst, Sidney M., to McDonnell Douglas Corporation. Compound curve-flat pattern process. 4,534,813, Cl. 156-212.000.
Willmar Schwabe GmbH & Co.: *See—*
Klessing, Klaus, 4,535,158, Cl. 544-118.000.
Willner, Lucas, Jr. Anti-skid device for vehicles. 4,534,508, Cl. 238-14.000.
Wilson, Ben F., to United States of America, Army. Coiled curvilinear solid propellant grain. 4,534,293, Cl. 102-289.000.
Wilson, Michael S. Stripping assembly for noodle cutting machinery. 4,534,251, Cl. 83-111.000.
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Wisser, Gerhard. Rotor or guide wheel of a turbine engine with shroud ring. 4,534,701, Cl. 415-168.000.
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Wolf, Anthony D., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,534,790, Cl. 71-93.000.
Wolf, Charles B.; Meyer, Thomas N.; Fey, Maurice G.; and Heidrich, John E., to Westinghouse Electric Corp. High power arc heater. 4,535,225, Cl. 219-383.000.
Wolf, Kurt; and Andre, Wolfram K., to Kurt Wolf & Co. KG. Saucepan and cover for a cooking utensil, particularly a steam pressure cooking pan. 4,535,229, Cl. 219-440.000.
Wolf, Wilhelm. Chin rest for a violin or the like. 4,534,259, Cl. 84-279.000.
Wollenhaupt, Peter: *See—*
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Woodard, Scott S., to Monsanto Co. Process for producing 1,1,2,3-tetrachloropropene. 4,535,194, Cl. 570-236.000.
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Wooding, Patrick J., to Wooding. Ultrahigh velocity water-cooled copper spinner. 4,534,177, Cl. 62-64.000.
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Woyton, Joseph T.; and Grant, George G., to Reliance Electric Company. Coupling alignment system. 4,534,114, Cl. 33-181.00R.
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Wu, Lung-chi; and Bretzloff, Carl W., to Campbell Soup Company. Mushroom supplement containing protein and a time delay coating. 4,534,781, Cl. 71-5.000.
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Yamano, Yuzo; and Oozeki, Hikaru, to Sony Corporation. Tape tension measuring device. 4,534,215, Cl. 73-862.440.

Yamaoka, Yukinori; and Takahashi, Takeshi, to Hitachi, Ltd. Gas-insulated switchgear equipment. 4,535,383, Cl. 361-341.000.

Yamato, Hideyuki; Maeda, Yuji; Yoshino, Fumisato; Takahata, Kyoya; Ikuzawa, Masanori; Kato, Tadaaki; and Yoshikumi, Chikao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pharmaceutical composition containing 24,25-dihydroxycholecalciferol in methods of treatment. 4,534,975, Cl. 514-730.000.

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Yanagihara, Hideo, to NSK-Warner K.K. Webbing take-up amount limiting device of a retractor. 4,534,520, Cl. 242-107.000.

Yang, James H. C.; Tomaszewski, Walter; and Beneze , Heinz W., to Firestone Tire & Rubber Company, The. Attachment device for securing flexible sheets. 4,534,145, Cl. 52-222.000.

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Yokoyama, Kazumasa; Fukaya, Chikara; Tsuda, Yoshio; Ono, Taizo; Arakawa, Yoshio; Inoue, Yoshihisa; Naito, Youichiro; and Suyama, Tadakazu, to Green Cross Corporation, The. Perfluorotricyclic amines as oxygen carriers. 4,535,085, Cl. 514-290.000.

Yokoyama, Shoji; and Sakakibara, Shiro, to Aisin Warner Kabushiki Kaisha. Hydraulic control system for a V-belt transmission. 4,534,243, Cl. 74-868.000.

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Yoldas, Bulent E.; and Partlow, Deborah P., to United States of America, Energy. Antireflective graded index silica coating, method for making. 4,535,026, Cl. 428-310.500.

Yoneda, Yasunobu, to Murata Manufacturing Co., Ltd. Ceramic compositions for a reduction-reoxidation type semiconducting capacitor. 4,535,064, Cl. 501-138.000.

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Yoshikane, Tetsuo; Kagata, Akira; and Hiura, Hiromi, to Matsushita Electric Industrial Co., Ltd. Information signal regenerating stylus and manufacturing method thereof. 4,534,136, Cl. 51-283.00R.

Yoshikawa, Kazuaki; Matsumura, Yuichi; and Mase, Noriaki, to Hitachi, Ltd; and Hitachi Service Engineering Co., Ltd. Apparatus for removing cladding material from bottom portion of control rod guide tube of nuclear reactor. 4,534,932, Cl. 376-310.000.

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Yoshino, Fumisato: *See*—
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Young, Ian R., to Picker International Limited. Nuclear magnetic resonance imaging apparatus. 4,534,358, Cl. 128-653.000.

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Young, Robert S.; and Leopard, Wilton. Chimney cleaning tool. 4,534,080, Cl. 15-23.000.

Yu, Terry T., to Energy Conversion Devices, Inc. Self-fixing imaging film containing reductant precursor. 4,535,055, Cl. 430-353.000.

Zabotto, Arlette; and Griat, Jacqueline, to Societe Anonyme dite: L'Oreal. Cosmetic compositions containing the fat of *Shorea robusta*. 4,534,981, Cl. 514-783.000.

Zahn, William L.; and Kufrin, Fred W., to Schwaab Inc. Stamp holding clip and rack therefor. 4,534,471, Cl. 211-39.000.

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Zaizen, Takashi; Otoguro, Yasuo; Yamanaka, Mikio; and Yamane, Shozo, to Nippon Steel Corporation. High Al heat-resistant alloy steels having Al coating thereon. 4,535,034, Cl. 428-653.000.

Zambon S.p.A.: *See*—
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Zanno, Paul R.; and Parliment, Thomas H., to General Foods Corporation. Flavoring with 1, 3-oxathianes. 4,534,988, Cl. 426-535.000.

Zarr, Myron, to Minnesota Mining and Manufacturing Company. Tape guidance for belt driven cartridge. 4,534,523, Cl. 242-192.000.

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Zeiler, Hans-Joachim: *See*—
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Zimmer, Robert E.: *See*—
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Zimmern, Bernard. Volumetric screw-and-pinion machine and a method for using the same. 4,534,719, Cl. 418-195.000.
Zink, John H., to AT&T Information Systems Inc. Data call transfer preindication. 4,535,199, Cl. 179-2.0DP.
Zlokarnik, Marko, to Bayer Aktiengesellschaft. Apparatus for flotation. 4,534,862, Cl. 210-221.200.
Znojkiewicz, Maciej E., to Northern Telecom Limited. Microwave cavity tuner. 4,535,308, Cl. 333-232.000.
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Zollner, Dieter H.; Zollner, Christine; Schieber, Franz; Lauterbach-Dammler, Inge; and Koziol, Konrad, 4,534,836, Cl. 204-67.000.
Zollner, Dieter H.; Zollner, Christine; Schieber, Franz; Lauterbach-Dammler, Inge; and Koziol, Konrad, to C. Conradty Nurnberg GmbH & Co., KG. Use of temperature and corrosion resistant gas-tight materials as guard elements for the metal portion of combination electrodes in the winning of metals by molten salt electrolysis. 4,534,836, Cl. 204-67.000.
Zonneveld, Frans W.; and Kramer, Cornelis, to U.S. Philips Corporation. Wavelength-sensitive radiography apparatus. 4,535,245, Cl. 250-385.000.
Zsadon, Bela: *See*—
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Zuiki, Shigeo: *See*—
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Zukausky, Keith E., to Eaton Corporation. Pilot operated valve assembly. 4,534,537, Cl. 251-30.030.
Zwick, David J., to Coleman Company, Inc., The. Lift assembly for movable cabinet. 4,534,601, Cl. 312-266.000.
Zwirlein, John F.: *See*—
Gates, William J.; and Zwirlein, John F., 4,534,802, Cl. 134-22.120.
49er Products: *See*—
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501 UBE Industries, Ltd.: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF AUGUST, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AT&T Bell Laboratories: *See*—
Sell, Darrell D., Re. 31,969, Cl. 372-38.000.

Boeing Company, The: *See*—
Mickelsen, Reid A.; and Chen, Wen S., Re. 31,968, Cl. 136-260.000.

Burns, Carmen D., to National Semiconductor Corporation. Gang bonding interconnect tape for semiconductive devices and method of making same. Re. 31,967, Cl. 430-314.000.

Chen, Wen S.: *See*—
Mickelsen, Reid A.; and Chen, Wen S., Re. 31,968, Cl. 136-260.000.

General Electric Company: *See*—
Riesland, David H.; Hammer, Edward E.; and Lemmers, Eugene, Re. 31,970, Cl. 315-276.000.

Hammer, Edward E.: *See*—
Riesland, David H.; Hammer, Edward E.; and Lemmers, Eugene, Re. 31,970, Cl. 315-276.000.

Lemmers, Eugene: *See*—
Riesland, David H.; Hammer, Edward E.; and Lemmers, Eugene, Re. 31,970, Cl. 315-276.000.

Mickelsen, Reid A.; and Chen, Wen S., to Boeing Company, The. Methods for forming thin-film heterojunction solar cells from I-III-VI_2 chalcopyrite compounds, and solar cells produced thereby. Re. 31,968, Cl. 136-260.000.

National Semiconductor Corporation: *See*—
Burns, Carmen D., Re. 31,967, Cl. 430-314.000.

Riesland, David H.; Hammer, Edward E.; and Lemmers, Eugene, to General Electric Company. High efficiency ballast system for gaseous discharge lamps. Re. 31,970, Cl. 315-276.000.

Sell, Darrell D., to AT&T Bell Laboratories. Laser control circuit. Re. 31,969, Cl. 372-38.000.

LIST OF DESIGN PATENTEES

Alessandro, Sante G., to Erwin-Lambeth, Inc. Lamp base. 280,134, 8-13-85, Cl. D26-106.000.

Allard, Douglas P.: *See*—
Provan, William R.; and Allard, Douglas P., 280,126, Cl. D23-45.000.

Allen, James H., to 'totes', incorporated. Expandable shopping bag. 280,043, 8-13-85, Cl. D3-42.000.

Allen, James H., to 'totes', incorporated. Expandable hand and shoulder bag. 280,044, 8-13-85, Cl. D3-48.000.

Alltrade Inc.: *See*—
Hillinger, George, 280,069, Cl. D8-49.000.

American Standard Inc.: *See*—
Shuman, William E., 280,108, Cl. D18-24.000.

Anderson, Clayton & Co.: *See*—
Levetz, Brenda K., 280,079, Cl. D9-433.000.

Arita, Toyomi: *See*—
Yajima, Hiroshi; Takada, Kazuo; Yamawaki, Yuichiro; Egashira, Teruaki; Matsui, Nobuo; and Arita, Toyomi, 280,136, Cl. D28-49.000.

Art Eyes, Inc.: *See*—
Guttenplan, Mark B.; and Friedman, Paul H., 280,137, Cl. D28-76.000.

AT&T Technologies, Inc.: *See*—
McGarvey, John N.; and Tilley, Alvin R., 280,098, Cl. D14-60.000.

Bakic, Dieter. Cosmetic case. 280,138, 8-13-85, Cl. D28-83.000.

Bakic, Dieter. Lipstick case. 280,139, 8-13-85, Cl. D28-85.000.

Bakic, Dieter. Lipstick case. 280,140, 8-13-85, Cl. D28-85.000.

Ball Corporation: *See*—
Haag, John H., Sr., 280,075, Cl. D9-370.000.
Haag, John H., Sr., 280,076, Cl. D9-370.000.

Barker, Layle B.; Fleischman, Frederick R.; and Swenck, George F., to Reynolds Metals Company. Machine for receiving used cans. 280,101, 8-13-85, Cl. D15-123.000.

Benedict, Charles E., to Telescoping Tie Racks, Inc. Article support rack. 280,045, 8-13-85, Cl. D6-328.000.

Benedict, Charles E., to Telescoping Tie Racks, Inc. Article support rack. 280,046, 8-13-85, Cl. D6-328.000.

Benedict, Charles E., to Telescoping Tie Racks, Inc. Article support rack. 280,047, 8-13-85, Cl. D6-328.000.

Benedict, Charles E., to Telescoping Tie Racks, Inc. Article support rack. 280,048, 8-13-85, Cl. D6-328.000.

Benedict, Charles E., to Telescoping Tie Racks, Inc. Article support rack. 280,049, 8-13-85, Cl. D6-328.000.

Berfield, Robert C.; and Meland, Ronald F., to Shop-Vac Corporation. Electric vacuum cleaner. 280,143, 8-13-85, Cl. D32-21.000.

Bird, George E.: *See*—
Butterfield, Ted; Bird, George E.; Paulsen, Gary A.; and O'Brien, Edward J., 280,125, Cl. D23-35.000.

Blower, Peter, to British Aerospace PLC. Vehicle for paraplegic persons. 280,089, 8-13-85, Cl. D12-128.000.

Blue Box Toy Factory Limited: *See*—
Takeuchi, Kazutaka, 280,115, Cl. D21-139.000.

Bonnefoy, Francis, to Posso S.A. Slide viewer. 280,103, 8-13-85, Cl. D16-17.000.

Bresie, Don A.; Burns, Jack M.; Fowler, Donald W.; and Sheets, Marion S. Combined truck rear steps and platform. 280,093, 8-13-85, Cl. D12-203.000.

Brian Davis and Company Proprietary Limited: *See*—
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Brooks, Loren L. Writing instrument. 280,110, 8-13-85, Cl. D19-42.000.

Brus, Robert M., to Toro Company, The. Holder for flat articles such as display cards or the like. 280,111, 8-13-85, Cl. D20-43.000.

Burns, Jack M.: *See*—
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Busch, Douglas I. Cover for a field camera focus plate. 280,105, 8-13-85, Cl. D16-38.000.

Butterfield, Ted; Bird, George E.; Paulsen, Gary A.; and O'Brien, Edward J., to Spraying Systems Co. Combined cap and spray tip for spray nozzle assembly. 280,125, 8-13-85, Cl. D23-35.000.

Calabro, Philip C., to Job, Inc. Playing card holder. 280,112, 8-13-85, Cl. D21-54.000.

Carlson, Arthur R., to Brian Davis and Company Proprietary Limited. Food container with press-in lid. 280,058, 8-13-85, Cl. D7-16.000.

Cassai, Gino H.; and Cassai, Henry J. Combined cosmetic container and applicator cap. 280,135, 8-13-85, Cl. D28-7.000.

Cassai, Henry J.: *See*—
Cassai, Gino H.; and Cassai, Henry J., 280,135, Cl. D28-7.000.

Central States Concrete Products, Inc.: *See*—
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Cesaroni, William C., to Dart Industries Inc. Apparatus for popping corn. 280,062, 8-13-85, Cl. D7-325.000.

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239	4,534,146
287	4,534,147
640	4,534,148

CLASS 53

76	4,534,149
390	4,534,150
415	4,534,151
434	4,534,152
448	4,534,153
458	4,534,154
459	4,534,155
503	4,534,156
531	4,534,157
552	4,534,159
562	4,534,158

CLASS 55

44	4,534,774
74	4,534,775
136	4,534,776
181	4,534,777
340	4,534,778

CLASS 57

22	4,534,160
125	4,534,161
217	4,534,162
233	4,534,163
290	4,534,164

CLASS 60

39.02	4,534,165
39.23	4,534,166
226.1	4,534,167
369	4,534,168
414	4,534,169
547.1	4,534,170
551	4,534,171
578	4,534,172
606	4,534,173
641.5	4,534,174
649	4,534,175

CLASS 62

6	4,534,176
64	4,534,177
124	4,534,178
128	4,534,179
141	4,534,180
180	4,534,181
193	4,534,182
374	4,534,183
376	4,534,184

CLASS 63

1 R	4,534,185

CLASS 65

6	4,534,779
348	4,534,780

CLASS 66

75.2	4,534,186
120	4,534,187

CLASS 68

3 R	4,534,188
5 D	4,534,189

CLASS 70

54	4,534,190
116	4,534,191
118	4,534,192
218	4,534,193
278	4,534,194
316	4,534,195

CLASS 71

5	4,534,781
21	4,534,782
27	4,534,783
7	4,534,784
88	4,534,785
	4,534,786
	4,534,787
92	4,534,788
93	4,534,789
	4,534,790

CLASS 72

61	4,534,196
98	4,534,197
201	4,534,198
276	4,534,199
305	4,534,200
348	4,534,201
349	4,534,202
481	4,534,203

CLASS 73

1 G	4,534,204
12	4,534,205
	4,534,206
23.1	4,534,207
49.3	4,534,208
59	4,534,209
	4,534,210
64.4	4,534,211
83	4,534,212
118	4,534,213
	4,534,214
147	4,534,216
178 R	4,534,217
204	4,534,218
587	4,534,219
599	4,534,220
626	4,534,221
653	4,534,222
703	4,534,223
730	4,534,224
860	4,534,225
861.84	4,534,226
861.87	4,534,227
862.44	4,534,215
862.45	4,534,228
863	4,534,229
863.23	4,534,230
864.43	4,534,231

CLASS 74

89.15	4,534,234
89.2	4,534,232
	4,534,233
128	4,534,235
364	4,534,236
476	4,534,237
489	4,534,238
501 R	4,534,239
545	4,534,240
597	4,534,241
600	4,534,242
868	4,534,243
869	4,534,244

CLASS 75

10 R	4,534,791
84.1 R	4,534,792
123 N	4,534,793

CLASS 81

90.1	4,534,245
111	4,534,246

CLASS 83

13	4,534,247
24	4,534,248
74	4,534,249
98	4,534,250
111	4,534,251
310	4,534,252
336	4,534,253
425.2	4,534,254
530	4,534,255
863	4,534,256

CLASS 84

1.03	4,534,257
1.15	4,534,258
279	4,534,259
293	4,534,260
384	4,534,261

CLASS 87

6	4,534,262

CLASS 89

8	4,534,263
14.3	4,534,264
14.6	4,534,265
36.02	4,534,266
40.03	4,534,267

CLASS 91

6	4,534,268
41	4,534,269
376 R	4,534,270
472	4,534,271
493	4,534,272
510	4,534,273

CLASS 92

187	4,534,274

CLASS 98

2	4,534,275
34.5	4,534,276
36	4,534,277
37	4,534,278
40.18	4,534,279
67	4,534,280
115.3	4,534,281

CLASS 99

451	4,534,282
468	4,534,283
498	4,534,284

CLASS 100

88	4,534,285
219	4,534,286

CLASS 101

93.05	4,534,287
211	4,534,288
348	4,534,289
365	4,534,290
426	4,534,291

CLASS 102

241	4,534,292
289	4,534,293
520	4,534,294

CLASS 104

7 B	4,534,295
8	4,534,296

CLASS 105

215 C	4,534,297
282 R	4,534,298

CLASS 106

1.23	4,534,797
14.05	4,534,794
89	4,534,795
99	4,534,796
266	4,534,798
270	4,534,799

CLASS 110

165 R	4,534,299
171	4,534,300
255	4,534,301
346	4,534,302

CLASS 112

114	4,534,303
262.1	4,534,304

CLASS 114

311	4,534,306
343	4,534,307

CLASS 118

260	4,534,308
410	4,534,309
620	4,534,310
630	4,534,311
666	4,534,312
696	4,534,313
733	4,534,314

CLASS 119

1	4,534,315
29	4,534,316
51 R	4,534,317
147 R	4,534,318

CLASS 122

15	4,534,319
406 R	4,534,320
448 B	4,534,321

CLASS 123

55 R	4,534,322
90.16	4,534,323
90.22	4,534,324
90.27	4,534,325
179 B	4,534,326
263	4,534,327
359	4,534,328
383	4,534,329
440	4,534,330
492	4,534,331
502	4,534,332
545	4,534,333
571	4,534,334

CLASS 126

429	4,534,335
431	4,534,336
445	4,534,337

CLASS 127

12	4,534,800

CLASS 128

1 A	4,534,338
6	4,534,339
66	4,534,340
75	4,534,341
163	4,534,342
200.23	4,534,343
201.15	4,534,344
203.15	4,534,345
205.12	4,534,346
303.1	4,534,347
305	4,534,348
334 C	4,534,350
	4,534,352
334 R	4,534,349
	4,534,351
346	4,534,353
402	4,534,354
635	4,534,355
	4,534,356
653	4,534,358
660	4,534,359
663	4,534,357
665	4,534,360
680	4,534,361
738	4,534,362
772	4,534,363
774	4,534,364
779	4,534,365
786	4,534,366

CLASS 131

75	4,534,367
110	4,534,368
235.1	4,534,369
237	4,534,370
359	4,534,371
	4,534,372

CLASS 133

5 R	4,534,373

CLASS 134

15	4,534,801
22.12	4,534,802
30	4,534,803

CLASS 135

22	4,534,374

CLASS 136

260	Re.31,968
261	4,535,195

CLASS 137

82	4,534,375
83	4,534,376
212	4,534,377
367	4,534,378
385	4,534,379
490	4,534,380
625.65	4,534,381
627.5	4,534,382
840	4,534,383
899.2	4,534,384

CLASS 139

79	4,534,385
114	4,534,386
435	4,534,387

CLASS 141

1	4,534,388
98	4,534,389

CLASS 144

373	4,534,390

CLASS 148

1.5	4,534,804
	4,534,806
12.3	4,534,805
20.3	4,534,807
133	4,534,808

CLASS 149

3	4,534,809
19.6	4,534,810

CLASS 150

52 R	4,534,391

CLASS 152

209 B	4,534,392
396	4,534,394
524	4,534,393

CLASS 156

73.1	4,534,811
132	4,534,812
212	4,534,813
300	4,534,814
307.5	4,534,815
345	4,534,816
352	4,534,817
466	4,534,818
515	4,534,819
603	4,534,820
617 SP	4,534,821
624	4,534,822
626	4,534,823
628	4,534,824
643	4,534,826
644	4,534,825
647	4,534,827

CLASS 159

16.1	4,534,828

CLASS 160

199	4,534,395
298	4,534,396

CLASS 162

23	4,534,397
103	4,534,398
212	4,534,399
361	4,534,829

CLASS 164

97	4,534,400
102	4,534,401
302	4,534,402
316	4,534,403
429	4,534,404
451	4,534,405

CLASS 165

12	4,534,406
81	4,534,407
108	4,534,408

109 T 4,534,409
126 4,534,410

CLASS 166

274 4,534,411
295 4,534,412
302 4,534,413
317 4,534,414

CLASS 171

16 4,534,415

CLASS 172

311 4,534,416
536 4,534,417
708 4,534,418

CLASS 173

1 4,534,419
12 4,534,420
130 4,534,421
134 4,534,422

CLASS 174

41 4,535,197
83 4,535,196

CLASS 175

4.6 4,534,423
40 4,534,424
53 4,534,425
65 4,534,426
67 4,534,427

CLASS 177

1 4,534,428
25 4,534,429
4,534,430

CLASS 179

2 DP 4,535,198
4,535,199
2 EA 4,535,200
18 FA 4,535,201
4,535,202
81 R 4,535,203
90 BD 4,535,204
110 A 4,535,205
170.2 4,535,206

CLASS 180

1 T 4,534,432
9 4,534,431
19.1 4,534,433
120 4,534,434
140 4,534,435
144 4,534,436
185 4,534,437
209 4,534,438
215 4,534,439
4,534,440
268 4,534,441
294 4,534,442
328 4,534,443

CLASS 182

2 4,534,444
48 4,534,445
146 4,534,446
152 4,534,447

CLASS 184

105.2 4,534,449

CLASS 187

9 R 4,534,450
12 4,534,451
29 A 4,534,452

CLASS 188

52 4,534,453

CLASS 192

18 A 4,534,454
40 4,534,455
58 A 4,534,456
70.2 4,534,457
98 4,534,458

CLASS 194

1 D 4,534,459

CLASS 198

482 4,534,460
592 4,534,461
781 4,534,462

CLASS 200

17 R 4,535,207
82 B 4,535,208
83 R 4,535,209
340 4,535,210

CLASS 203

86 4,534,830

CLASS 204

4 4,534,831
15 4,534,832
28 4,534,834
67 4,534,835
4,534,836
128 4,534,833
129 4,534,837
159.13 4,534,838
159.23 4,534,839
192 E 4,534,842
192 P 4,534,841
192 R 4,534,840
202 4,534,843
281 4,534,844
283 4,534,845
290 R 4,534,846

CLASS 206

267 4,534,463
343 4,534,464
443 4,534,465
518 4,534,466
530 4,534,467
534 4,534,468
560 4,534,469

CLASS 208

8 LE 4,534,847
10 4,534,848
11 R 4,534,849
22 4,534,850
48 R 4,534,851
89 4,534,852
120 4,534,853
131 4,534,854
253 4,534,855

CLASS 209

1 4,534,856
166 4,534,857
236 4,534,858
301 4,534,859
585 4,534,470

CLASS 210

137 4,534,860
168 4,534,861
221.2 4,534,862
232 4,534,863
603 4,534,864
692 4,534,865
697 4,534,866
722 4,534,867
780 4,534,868
788 4,534,869

CLASS 211

39 4,534,471
41 4,534,472
58 4,534,473
70 4,534,474
126 4,534,475

CLASS 212

190 4,534,476

CLASS 215

215 4,534,477
230 4,534,478
252 4,534,479
4,534,480
253 4,534,481
272 4,534,482
306 4,534,483
307 4,534,484

CLASS 219

10.49 R 4,535,211
10.77 4,535,212
57 4,535,213
60.2 4,535,214
61.5 4,535,215
68 4,535,216
69 M 4,535,217
121 LC 4,535,219
121 LH 4,535,218
121 LM 4,535,220
204 4,535,221
300 4,535,222
354 4,535,223
373 4,535,224
383 4,535,225
400 4,535,226
411 4,535,227
4,535,228
440 4,535,229
470 4,535,230

CLASS 220

203 4,534,485
241 4,534,486
305 4,534,487
323 4,534,488
404 4,534,489
435 4,534,490

CLASS 221

63 4,534,491
203 4,534,492

CLASS 222

146.2 4,534,493
148 4,534,494

CLASS 223

101 4,534,495

CLASS 224

326 4,534,496

CLASS 225

25 4,534,497

CLASS 226

181 4,534,498
184 4,534,499

CLASS 227

7 4,534,500
65 4,534,501

CLASS 228

102 4,534,502
157 4,534,503

CLASS 229

15 4,534,504
33 4,534,505

CLASS 236

35.3 4,534,506

CLASS 237

12.3 A 4,534,507

CLASS 238

14 4,534,508

CLASS 239

34 4,534,509
97 4,534,510
336 4,534,511
394 4,534,512
428.5 4,534,513
4,534,514
542 4,534,515

CLASS 241

171 4,534,516

CLASS 242

35.5 A 4,534,517
56 R 4,534,518
68.3 4,534,519
107 4,534,520
107.4 A 4,534,521
172 4,534,522
192 4,534,523

CLASS 244

17.25 4,534,524
30 4,534,525
38 4,534,526

CLASS 246

445 4,534,527

CLASS 248

210 4,534,528
222.1 4,534,529
239 4,534,530
345.1 4,534,533
351 4,534,531
371 4,534,532
424 4,534,534
636 4,534,535

CLASS 249

83 4,534,536

CLASS 250

201 4,535,231
206 4,535,232
214 A 4,535,233
238 4,535,234
282 4,535,235
292 4,535,236
327.2 4,535,237
4,535,238
339 4,535,239
4,535,241
342 4,535,240
363 S 4,535,242
4,535,243
372 4,535,244
385 4,535,245
390 4,535,246
436 4,535,247
459.1 4,535,248
491.1 4,535,249
507.1 4,535,250
551 4,535,251

CLASS 251

30.03 4,534,537
62 4,534,538
65 4,534,539
203 4,534,540
331 4,534,541
342 4,534,542

CLASS 252

8.55 R 4,534,870
12 4,534,871
32.7 E 4,534,872
4,534,873
51.5 A 4,534,874
71 4,534,875
90 4,534,876
106 4,534,877
173 4,534,878
174 4,534,879
174.13 4,534,880
180 4,534,881
182 4,534,882
299.63 4,534,883
301.4 H 4,534,884
301.4 P 4,534,885
502 4,534,886
503 4,534,887
511 4,534,888
4,534,889
522 R 4,534,890
4,534,891
545 4,534,892
629 4,534,893

CLASS 254

1 4,534,543
9 C 4,534,544

CLASS 260

112 R 4,534,906
112.7 4,534,894
239 A 4,534,896
239 BC 4,534,895
239.3 R 4,534,897
245.3 4,534,898
403 4,534,899
410.6 4,534,907
428.5 4,534,900
458 C 4,534,908
465 G 4,534,909
465.4 4,534,902
465.5 R 4,534,903
465.6 4,534,910
502.5 F 4,534,904
505 C 4,534,905
549 4,534,912

CLASS 261

34 B 4,534,913
64 B 4,534,914

CLASS 264

1.4 4,534,915
2.1 4,534,916
12 4,534,917
22 4,534,918
29.2 4,534,919
4,534,920
39 4,534,921
119 4,534,922
156 4,534,923
259 4,534,924
281 4,534,925
4,534,926
321 4,534,927
334 4,534,928
338 4,534,929
513 4,534,930

CLASS 267

64.24 4,534,545

CLASS 269

58 4,534,546
182 4,534,547

CLASS 270

58 4,534,548

CLASS 271

103 4,534,549
183 4,534,550
275 4,534,551
279 4,534,552

CLASS 272

73 4,534,553
144 4,534,554
145 4,534,555

CLASS 273

1.5 R 4,534,556
55 A 4,534,557
78 4,534,558
113 4,534,559
143 R 4,534,560
149 P 4,534,562
149 R 4,534,561
157 R 4,534,563
169 4,534,564
241 4,534,565
248 4,534,566
255 4,534,567
421 4,534,568

CLASS 277

27 4,534,569
95 4,534,570
128 4,534,571
235 B 4,534,572

CLASS 279

1 K 4,534,573
112 4,534,574

CLASS 280

6.11 4,534,575
47.26 4,534,576
90 4,534,577
281 R 4,534,578
402 4,534,579
712 4,534,580

CLASS 281

15 R 4,534,581

CLASS 283

81 4,534,582

CLASS 285

24 4,534,583
4,534,584
92 4,534,585

CLASS 290

44 4,535,252

CLASS 292

228 4,534,586
263 4,534,587

CLASS 294

81.5 4,534,588

CLASS 296

182 4,534,589

CLASS 297

180 4,534,590
270 4,534,591
284 4,534,592
4,534,593
438 4,534,594
452 4,534,595

CLASS 298

27 4,534,596

CLASS 299

81 4,534,597

CLASS 303

10 4,534,598
22 R 4,534,599

CLASS 307

9 4,535,253
38 4,535,254
264 4,535,255
4,535,256
362 4,535,257
454 4,535,258
530 4,535,259

CLASS 308

3.6 4,534,600

CLASS 310

12 4,535,260
78 4,535,261
88 4,535,262
112 4,535,263
232 4,535,264
313 C 4,535,265

CLASS 312

266 4,534,601

CLASS 313

414 4,535,266
481 4,535,267
569 4,535,268
579 4,535,269

CLASS 315

8.0 4,535,270
209 R 4,535,271
276 Re.31,970
366 4,535,272
401 4,535,273

CLASS 318

254 4,535,274
4,535,275
4,535,276
561 4,535,277
687 4,535,278
696 4,535,279
798 4,535,280

CLASS 322

28 4,535,281

CLASS 323

269 4,535,282
365 4,535,283

CLASS 324

71.1 4,535,284
4,535,285
79 R 4,535,286
142 4,535,287
161 4,535,288
208 4,535,289
309 4,535,290
320 4,535,291
330 4,535,292
336 4,535,293

CLASS 328

150 4,535,294
155 4,535,295

CLASS 329

103 4,535,296
126 4,535,297

CLASS 330

189 4,535,298
279 4,535,299
4,535,300
4,535,301
287 4,535,302
297 4,535,303
300 4,535,304

CLASS 331

23 4,535,306
111 4,535,305

CLASS 333

35 4,535,307
232 4,535,308

CLASS 335

42 4,535,309
61 4,535,310
124 4,535,311
196 4,535,312
212 4,535,313

CLASS 338

21 4,535,314
34 4,535,315
4,535,316
36 4,535,317

CLASS 339

14 R 4,534,602
17 C 4,534,603
17 D 4,534,604
75 M 4,534,605
4,534,606
89 R 4,534,607
91 R 4,534,608
117 R 4,534,609
206 P 4,534,610
217 S 4,534,611
255 P 4,534,612
258 S 4,534,613

CLASS 340

347 AD 4,535,319
347 CC 4,535,318
347 DD 4,535,320
520 4,535,321
571 4,535,322
572 4,535,323
574 4,535,324
636 4,535,325
679 4,535,326
719 4,535,327
739 4,535,328
785 4,535,329
825.06 4,535,332
825.5 4,535,330
825.69 4,535,333
908 4,535,331
995 4,535,334
4,535,335

CLASS 343

713 4,535,336
737 4,535,337
781 CA 4,535,338

CLASS 346

75 4,535,339
76 PH 4,535,340
107 R 4,535,341
108 4,535,342
139 D 4,535,344
140 R 4,535,343
4,535,346
159 4,535,345
208 4,535,347
221 4,535,348

CLASS 350

1.4 4,534,614

6.1 4,534,615
96.20 4,534,616
4,534,617
96.23 4,534,618
98 4,534,619
166 4,534,620
257 4,534,621
334 4,534,622
339 R 4,534,623
429 4,534,624
4,534,625
454 4,534,626

CLASS 351

47 4,534,627
153 4,534,628

CLASS 352

140 4,534,629
194 4,534,630

CLASS 353

95 4,534,631

CLASS 354

81 4,534,632
237 4,534,633
268 4,534,634
322 4,534,635
403 4,534,636
4,534,637
418 4,534,638
432 4,534,639
448 4,534,640

CLASS 355

3 R 4,534,641
3 SH 4,534,643
14 E 4,534,642

CLASS 356

30 4,534,644
125 4,534,645
312 4,534,646
344 4,534,647
350 4,534,648
351 4,534,649
376 4,534,650
440 4,534,651

CLASS 357

23.6 4,535,349
74 4,535,350

CLASS 358

10 4,535,351
16 4,535,352
21 V 4,535,353
88 4,535,354
123 4,535,355
145 4,535,356
150 4,535,357
158 4,535,358
163 4,535,359
181 4,535,360
184 4,535,361
194.1 4,535,362
213 4,535,363
228 4,535,364
287 4,535,365
342 4,535,366

CLASS 360

10.2 4,535,367
28 4,535,368
55 4,535,369
60 4,535,370
67 4,535,371
77 4,535,372
97 4,535,373
103 4,535,374
113 4,535,375
126 4,535,376

CLASS 361

1 4,535,377
18 4,535,378
124 4,535,379
256 4,535,380
308 4,535,381
319 4,535,382
341 4,535,383
386 4,535,384
388 4,535,385
389 4,535,386
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